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DR. KENNEDY

ON THE

MANAGEMENT OF CHILDREN

IN

HEALTH AND DISEASE.

DR. KENNEDY

HAS READY FOR PRESS,

Instructions to Mothers

On the MANAGEMENT of the FEMALE CONSTITUTION in Health
and Disease, &c. &c.

INSTRUCTIONS

TO

MOTHERS AND NURSES

ON THE

MANAGEMENT OF CHILDREN

IN HEALTH AND DISEASE;

COMPREHENDING DIRECTIONS FOR REGULATING THEIR
DIET, DRESS, EXERCISE, AND MEDICINE;

WITH A

VARIETY OF PRESCRIPTIONS ADAPTED TO THE USE OF THE
NURSERY, AND AN INDEX OF MEDICAL TERMS.

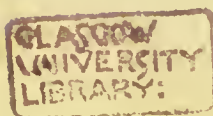
By JAMES KENNEDY, M. D.

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TO
MRS. E. W. A. HAY,
IN TESTIMONY OF THE
AUTHOR'S REGARD
AND AFFECTION.

MDCCCXXIV.



PREFACE.

THE doctrines inculcated in this volume have been deduced from attentive observation of the effects of management and of medicine on the manifold circumstances of Children in Health and Disease:—they are the results of extensive reading, of considerable practical experience, and of much reflection; and, though communicated in a didactic style, are submitted with deference to the judgment of parents, and with the sincerest solicitude that their applications may be found beneficial.

Agreeably to its natural arrangement, the Work is divided into two parts:—the first, after an introductory description of the three first epochs of life, includes a concise illustration of the modes whereby the chief diversities of Food, Dress, Air, and Exercise can be so managed by parents as to promote the comfort, strengthen the constitution, and remove or mitigate the various ailments of children:—in the second, are enumerated the methods of treating their diseases to a definite extent, beyond which any interference of the unskilful might prove injurious or fatal:—more than this would tend only to perplex, or lead into dangerous security, those to whom the guardianship of young persons may be intrusted.

Professional subjects cannot possibly be investigated or explained in diction purely popular:—this necessity has

led to the use of some terms in technical language; but these have been introduced sparingly, and a glossary of their meanings is annexed to the work, which also contains a copious index and a table of contents, for the purpose of facilitating reference to particular subjects.

Many of the remedies recommended in these pages are readily susceptible of domestic preparation:—for the sake of convenience, therefore, a select variety of prescriptions adapted to the use of the Nursery, and the rules for compounding the medicines, are subjoined.

Friendship, or other principles, will place this Book in the hands of readers who shall easily recognise in it, many of the precepts and proceedings they have often, during the last twelve years, seen applied at the sick-beds of their little ones:—those persons already possess such evidence as may enable them to appreciate the salutary efficacy of these means under their different modifications:—others are afforded an opportunity of estimating what advantages they shall confer, by their present aim at the attainment of more extended usefulness.

GLASGOW, }
November, 1824. }

Note:—It will readily be perceived that the plan of this Work could not admit the usual insertion of authorities:—this, however, is unimportant; because, where the words of any former author have been employed, his *ideas and views* are common to the profession:—such as are not, the present writer has advanced on his own responsibility.

CONTENTS.

PART I.

INTRODUCTORY DESCRIPTIONS.—State of man antecedently to birth, p. 4—22;—infancy, 22—32;—childhood, 32—40.

DENTITION.—Teething, 40;—nature of the teeth, 40;—their number and structure, 42—51;—their formation, and elementary principles, 51—63.

NUTRITION.—It is the process by which the growth and strength of animals are promoted, 64;—the constituent parts and uses of milk, 64—79;—its qualities affected by food and air, emotions and habits, and disease, 79—82;—rules for nursing, choosing a nurse, and giving artificial food to infants, 82—90;—aliments most suitable to the varying circumstances of infants and children, 90—93.

DRESS.—Nature, influences, and modifications of dress with regard to the age and peculiarities of children, 94;—substances of which clothes are formed, 94—96;—their physical properties, 96—98;—their shapes, 98—100;—their effects on the human frame, relatively to age, sex, habit, and other conditions of life, 100—107.

AIR AND EXERCISE.—Import of these terms, 107;—influences of the atmosphere on animated nature, 108—126;—management of new-born infants, 126—130;—causes that impart to spontaneous motion the power of altering the order of the vital functions, 130—133;—exercise is *active* as in walking, running, dancing, pursuits of the chase, fencing, various games, swimming, and the different uses of the vocal organs, 134—143;—and it is *passive*, as in dandling and patting infants, frictions of their persons, rocking them in cradles and suspended couches, swinging, balancing, riding on horseback or in carriages, sailing in open boats and in ships, 143—163;—effects of exercise on digestion, circulation, respiration, absorption, secretion and perspiration, nutrition, and locomotion, and through them on organization, intelligence and life, 163—173;—conduciveness of exercise to the preventing, relieving, and removing many, especially infantile diseases, 173—179.

PART II.

INTRODUCTORY remarks on the effects of sleep, water, and medicine on disease, p. 179;—causes and nature of sleep, 179;—violent rocking of infants and giving them laudanum, very injurious, 184;—

properties of spring and atmospheric water, in their cold and heated, or alkaline, calcarious, carbonated, purgative, and sulphureous forms, 187;—virtues of lavements as vehicles of medicine, 194;—external applications, as gargles, 198;—lotions and fomentations, 199;—liniments and ointments, 200;—blisters, 200;—poultices, 202;—frictions, 204;—and leeches, 206;—general view of the manner in which medicine operates in curing disease, 210;—peculiar nature and properties of laxative and emetic substances, 213;—cautions relatively to their indiscriminate use, 219.

ARRANGEMENT of the diseases of children, 220—221;—the fetal, when remediable, to be treated by the surgeon after birth, 221—224;—local, introduced by remarks on still-born infants, 224—227;—dislocations and fractures, 227;—compression of the infant's head during the birth;—228;—closure of the excreting passages, 228;—protrusion of the brain, 228;—ruptures, 229;—defects and deformities, 231;—tongue-tied children, 232;—hare-lip, 235;—bleeding, ulceration, and imperfect shriveling of the navel, 236—238;—warts and corns, 238—239;—milky distension of the nipples, 239;—tumours of the breasts, 240;—chilblains, scalds, and burns, 241—244;—marks and spots, with remarks on the power of the mother's imagination in forming them, 245—247;—squinting, 248;—bleeding from the nose, 249;—tooth-ache and affections of the gums, 250—252;—ear-ache and temporary deafness, 252—254;—excoriations behind the ears, 254;—boils, whitlow, and sty, 255—257;—and the purulent sore eyes of infants, 257,—260;—abdominal diseases, or those situated within the belly, 260;—worms and the various modes of procuring their expulsion, 260—265;—fevers, 265;—confinement of the bowels, 266;—excessive and offensive discharges from them, 268;—sickness and vomiting, 270;—gripes and colic pains, 271;—diseased liver, 272;—St. Vitus' dance, 273;—strumous decline, 265;—scrofula, 278—284;—thoracic diseases, 285;—malformation of the heart and dropsy of its capsule, 286;—croup, 286—289;—chincough, 290;—cephalic diseases, 293;—common cold, 293;—mumps, 294;—thrush, 295;—difficult teething, 297;—nervous fits, 298;—water in the head, 299;—cutaneous diseases, 301;—yellow-gum and white-gum, 301;—red-gum, 301;—wild-fire-rash, pale gum-rash and tooth-rash, 302;—blisters, 302;—blotches and blains, 303;—skin bound, 304;—dandriff, 304;—milky scall, 305;—scalled head, 305;—honey-comb scall, 306;—lupin-scald, 307;—branny scall, 307;—ring-worm scall, 307;—itch, 308;—herpetic eruptions, 309;—water-pox, 310;—chicken-pox, 310;—swine-pox: 310;—globular-pox or hives, 310;—clustering water-pox, 310;—vesicular fever, 311;—rose, 312;—rose-rash, 312;—nettle-rash, 313;—measles, 314;—scarlet fever, 314;—small-pox, 316;—cow-pox, 316—318.

PART I.

ON THE

MANAGEMENT OF CHILDREN

IN HEALTH.



ON THE

MANAGEMENT OF CHILDREN

IN HEALTH.

CONFORMABLY to a determinate law of his economy as an animated being, Man, in passing successively through the different stages of life, changes the proportions, not only of his stature, but also of the mutual relations of his organic systems. By the same law, likewise, he experiences incessant variations in the development of his organs themselves and his visceral structures,—in the importance and activity of their functions,—in the character and quantity of the products which these functions elaborate,—and, by consequence, in all that in him on what his individuality depends. Observation of these consecutive changes which complete the ultimate term of his mortal existence, enables philosophical inquirers to find reason for distinguishing it into six natural epochs:—the foetal state,—infancy,—childhood,—adolescence,—the adult period,—and old age. In the three former are included all what, for the sake of convenience, shall in this work be denominated the circumstances of children.

Each of these epochs is accompanied,—in health and disease,—by an almost unvarying assemblage of distinctive characters. The Foetal State comprehends that inter-

esting period, which intervenes between the dawn of its organic development and the birth of the new being:—Infancy terminates with the seventh year, when indications of the second dentition commence being perceived:—and, Childhood may be considered as extending to the thirteenth or fourteenth year of life; on which occasion the primary manifestations of puberty become apparent, and the intellectual faculties begin to make remarkable advances in their progress toward maturity.

FCETAL STATE.

MANY and very diversified experiments have been instituted, for the purpose of determining what are the primitive appearances of the fœtal germ; but, the nicest modes of attempting its detection, although conducted by physiologists the most inventive and skilful, have altogether failed of discerning it sooner than the nineteenth day subsequent to its original formation. At this time, it is first observed in the form of a membranous vesicle, containing, in its centre, an opaque mucous substance, resembling a small worm, and bent in the shape of a crescent. This minute body, soon afterwards, exhibits some darkening points, and other marks more directly indicative of its advancing organization. A red speck appears in the place corresponding to the heart's after-position, and performs very evident pulsations. By and by, several reddish lines, issuing from this remarkable spot, define the course of the large blood-vessels; and, a cluster of slender filaments, arising from its middle, keep this bud of a future being suspended from the pellicle by which it is enveloped.

Between the third and fourth week, the head comes to be discernible, in the form of a very thin transparent globe, equal in size to the rest of its body. By the end of a month, it has acquired dimensions, which are usually placed in comparison with those of a large ant, of a lettuce-seed, or of a barley-corn. It measures from four to five lines in length; and, being inclined forwards, presents a singular figure,—fancifully compared to a mallet,—having one of the extremities large, and the other disproportionately small. Now, likewise, the primary roots of the legs and arms are observable as minute globulated tubercles, at their origins in the lower body and the chest.

Its size, in the sixth week, has increased to that of a common bee:—it is, in length, between eleven and twelve lines:—the head has now become large as the half of its body:—the outline of its spinal column is also apparent:—and the rudiments of its four extremities have attained still farther development.

When two months have elapsed, it is two inches long, and its configuration may be readily ascertained. Two black dots indicate the forming eye-balls:—the mouth, beginning to open, is already quite distinct:—two small orifices, in either side of the head, denote the site of the ears; and a minute convex filament, that of the nose. The head's dimensions have perceptibly augmented:—the arm and fore-arm, the thighs and legs, and the first lines of the toes and fingers, are now distinguishable. Osseous particles also present themselves to view, in the clavicles, and in all the long bones. In fourteen days more, the different lineaments of the face, from its progressive enlargement, may be plainly discovered:—the lips, the eyelids, the nose, and the ears, are yet more fully deve-

loped:—and, there is an obvious fulness in the situations afterwards occupied by external organs.

By the third month of its existence, all the parts of the foetal frame are visible and well-defined. It is then nearly three inches in length, and weighs about three ounces:—its sex also is apparent; and, in some instances, faint traces of the nails have been observed. Its shapes, in another month, became more exact:—the arms and limbs are capable of being extended:—a reddish fatty substance begins to be deposited in the subcutaneous cells:—and, the muscles exercise perceptible movements. Its growth is now very rapid; and, in ten or fifteen days, its length extends to six or seven inches. In ten days more, its lower limbs are found much longer than the arms:—it is then eight or nine inches long:—its motions exhibit greater vigour:—and, its specific weight has manifestly obtained considerable accessions.

Such is the degree of its strength and energy in the sixth month, that some physiologists have supposed the new-formed creature capable of living*, for some time at

* A few very rare instances of the human offspring having been *born alive* at four months, are preserved in the pages of medical history. It has as rarely *continued alive*, when its birth took place between the fifth and sixth months of its foetal existence. Nevertheless, Fortunio Liceti, a celebrated philosopher of the sixteenth century, was born in the *fifth* month, and preserved by the extraordinary exertions of his father who practised as a physician with great respectability and success.—Liceti was upwards of eighty years old when he died.

Popular belief admits the statement to be a fact,—that more children are born and live at the seventh than the eighth month of the foetal state. This notion has descended, undisturbed, among the traditions of primeval times; and, even in our own days, finds

least, after separation from its mother. At this period, it has been found to exceed eleven inches in length. Its head continues to be predominant, in size, above all the other members; but the skull remains pliant and gristly, with its "open"* very extensive. The foetal skin, as yet,

some advocates in the medical profession. All this, however, does not contribute any thing towards the establishment of its accuracy. Very numerous,—almost innumerable,—observations afford results which, by the strongest inductions, demonstrate the truth of the opposite axiom,—that more than one half of those infants who are born in the eighth month do live, while of such as have been born in the seventh, not very many survive. Dr. Merriman of London,—whose authority, founded entirely on practical experience, must be held as decisive on such a question,—has published a List containing *seventy* cases of premature birth. Of these, *thirty-six* were children born in the *eighth* month, and *thirty-four* in the *seventh*:—among the former, only *eight* died during the first *four* weeks; but, of the latter, *twenty-one* died within the same period.—In twin-cases, this observation holds equally good, and nearly in the same proportion; and, of still-born children also, by far the greater number is in the seventh, than in the eighth month.—However much, therefore, we may be disposed to respect traditional opinions, there can be no philosophy in maintaining them, when their inconsistency with nature and general experience has been made evident.

* "*Open of the Head.*"—The aperture, emphatically so denominated in colloquial language, is occasioned by a considerable portion of the skull, between the parietal and divided frontal bone, being imperfectly ossified in new-born children. It has also been named "*the fontanel*," from a pulsation of the brain being distinctly perceived underneath the yielding teguments by which it is covered. The defect, however, is quite natural, and depends on the late ossification of the angles of these bones,—the last in the body to assume the true osseous consolidation. In general, this opening is obliterated within a year after birth; but there are

is exquisitely fine, thin, and smooth:—the palms of the hands and the soles of the feet, the face, the lips, the ears, the breasts, and other parts, are remarkable for their purple colour. The hair possesses a white or silvery hue:—the eye-lids adhere, sometimes with considerable firmness, to each other:—the eye-brows and eye-lashes seem scanty:—the pupil is generally inclosed in a particular membrane:—and, the nails are either wanting, soft, or defective in thickness or in length.

With the seventh month, its vitality has greatly increased:—all its textures are more compact:—its length is fourteen or fifteen inches:—and, the infant prematurely born, at this period, not unfrequently survives. The skin now assumes a rosy tinge, and the sebaceous follicles interspersed through it, begin to secrete an oily fluid which is deposited over the surface, and forms the whitish unctuous coat found on most parts of the body, at the time of its escape from the fœtal state. The eye-lids also cease to be conglutinated:—the hairs grow longer, and get a flaxen colour:—its inclusive membrane disappears from the pupil:—and greater firmness of the nails has supervened.

Its length, in the eighth month, is sixteen or seventeen inches:—soft downy hair covers its body:—the sebaceous layer on its surface is more observable:—and the hairs on its head have grown longer, its nails firmer. The structure of its skin is more condensated and distinct. Its motions likewise have attained greater vigour:—and all its textures and organs now approach the consummation of their development. Oftentimes, at this stage, the

many recorded instances of its remaining unclosed, in certain individuals, through all the stages of a very protracted life.

breasts are full and protuberant, and contain a milky fluid, the use of which has not been ascertained.

Having completed the ninth month, the nascent creature has fully attained its foetal maturity:—it is from eighteen to twenty or more inches in length:—in proportion to its person, the head continues to be unequally large:—the cranial bones, though moveable, approximate each other with their edges:—the fontanel is smaller:—the hairs are still longer, stronger, darker in colour:—the nails, now thicker and more solid, extend to the ends of the toes and fingers:—and, the unctuous deposition on the surface is denser and more adhesive.

From these sketches, which are necessarily very general, it may be understood,—that, the progressive organization of the foetal being goes on with great vigour, during the earlier days of its existence:—that, it becomes slower in the second month; acquires renewed activity in the third; and, by the beginning of the fourth, is again considerably retarded:—that, in two weeks more, it resumes an accelerated progress, which is continued till the sixth month:—and that, between the last period and the birth, it makes gradual but less rapid advances.

Equally worthy being contemplated, are the circumstances which accompany the origin and formation of the foetal organs, destined to perform vital and natural functions. These are chiefly internal organs, and some of them disappear when their respective offices become unnecessary in the system.—Among others may be noticed, in particular, the bones and teeth,—the muscles,—the lungs,—heart,—blood-vessels,—blood itself,—the brain and nerves,—the stomach,—liver,—and other parts concerned in performing the operations of digestion, secretion, and excretion.

Bony structure is elaborated by a succession of the most simple and beautiful of the processes depending on vital action. When first perceived in the fœtal form, its rudiments seem to be entirely composed of a substance, having the apparent principles of a clear mucous, or gelatinous fluid. Even at the earliest period of its formation, every recent bone is invested with a membrane which modifies its future shape. The jelly-like substance is, in due time, replaced by an organized mass resembling cartilage, in the centre of which, by means of its own vessels, minute osseous points begin to be formed. These gradually send out a multitude of spiky fibres, radiating from the middle to the ends or circumference of each bone which, in this manner, attains its perfected state, when marrow begins to be secreted in its cells or medullary canals. When madder, mingled with food, is given to animals, their bones acquire a red tinge. This singular change commences sooner in the young than the old, and proceeds with greater rapidity. In the former, their bones assume a rose colour, in twenty-four hours:—in three days, they become deep scarlet. Those remotest from the heart are the last to undergo this alteration. When the madder is withdrawn the bones, in due time, regain their native whiteness.—Whether considered with regard to its structure or its uses, the spine forms one of the most important parts of the osseous system:—its fœtal peculiarities may, therefore, obtain some attention.

Antecedently to birth as well as after it, this beautiful piece of animal mechanism exhibits different proportions, in the different stages of life:—it generally forms two-fifths of the whole height of an adult person:—its progressive elongations, during the fœtal period, are placed in relation with those of the entire being, in the subjoined

COMPARATIVE TABLE.

AGE.	LENGTH OF SPINE. LENGTH OF INFANT.	
	In Days.	In Lines.
Twenty-one.....	III.....	4
Thirty-five.....	XI.....	18
Forty-five.....	XIV.....	30
Fifty-four.....	XX.....	43
Eighty-four.....	XXVII.....	60
One hundred and twenty-six.....	XL.....	90
One hundred and sixty-eight.....	L.....	120
One hundred and ten.....	LXV.....	150
Two hundred and fifty-two.....	LXXII.....	180

In their initial state, the teeth present themselves to observation in the form of minute pulpy substances, comprehended severally in a peculiar membrane originating from a cavity of the gums. Each of these substances comprizes the elements of an immature tooth, which is regularly and consecutively perfected by an admirable but complicated process of secretion, deposition, and induration. Till the fourth month of foetal life, the evolutions of their structure and configuration cannot be made an object of examination; but, subsequently to that period, the rudiments of all the first set of teeth and of four, in each jaw, of the second, may be distinctly seen, and the stages of their successive augmentations unerringly retraced.

Muscular texture is distinguishable soon after the foetal germ has come to be a direct object of examination. It is then pale and transparent, and its different packets are so blended together as to form a gelatinous substance, in which the elements of their fibres may readily be de-

tected. Some traces of cellular membrane, in a short time, separate the individual muscles, which now acquire a red colour:—their tendons, hitherto imperceptible, also become apparent, and are remarkable for their pearly whiteness. Those, whose actions conduce to the vital functions of respiration and digestion, are the earliest to be modelled; and, through the successive stages of their growth, continue the largest, strongest, and best defined. With advancing age, they gradually attain that degree of fibrous condensation whereby they are characterized, and which adapts them to the discharge of their appropriate functions.—From their being insensible to electric and galvanic excitement after death, it has been concluded, that,—at least till the sanguineous circulation is established in them,—the foetal muscles do not possess the power of contraction.

Foetal life is independent of the influences of the lungs; and, in consequence of this arrangement, these very delicate organs are late of coming into existence, slow in the gradations of their development, and never, till the dawn of infancy, begin their essential actions. Manifest traces of their primary tissues are seldom discoverable till the sixth or seventh week:—then they appear behind the heart, near the origin of the great thoracic artery, in the form of two minute bodies quite approximate to each other. They are flat, white in colour, have a smooth surface and jagged margins, and seem to be perfectly solid. When the foetal being is five months old, seven inches and a half long, and weighs from four to five ounces, the lungs are only sixty grains in weight, and their proportion is as one to forty and a half relatively to the heart. By the seventh and eighth months, although still small, they have acquired a red tinge; and, at the

end of the ninth, are perceived to be redder, and larger in size, though always dense, and heavier than water.

From its being indispensable to the growth of the new being, the heart is one of its primary organs. It acquires form betimes, and is early observable. Its dimensions, in the embryonic mass, are disproportionately large; but this excess imperceptibly decreases, with the progress of its age. When the germ itself presents its outline to microscopic search, it is inclosed in a filmy capsule, from whose centre a reddish fibril goes to be inserted in what represents the future body. Nearly on the middle of this, are three vesicular particles:—one of these is the heart's left ventricle; the other, the root of the great vein; and the third, the origin of the principal artery. Its successive developments now proceed with vigour and activity.

By the middle of the eleventh month, the foetal heart resembles a grain of wheat, and the lineaments of its auricles are, in many instances, apparent. Sometimes also, the partition which divides its right and left cavities may now be perceived: but, till the hundredth day, it most frequently remains indistinct. At this time, come into view,—the right ventricle,—the aperture, which is very large, in the partition,—and also the right auricle, whose size as yet is greater than that of the left. While in this state, the heart altogether does not exceed two lines and a half in length. Between the fifth and sixth months, its four cavities are completed; the circular opening in its partition enlarged; its length is five lines; and its proportions as one to one hundred and twenty, comparatively to the rest of the body. All its parts, internal and external, are quite distinct during the lapse of the seventh month. Its length is now about an inch and a half: its

shape pyramidal. At birth, it differs little, except in proportional magnitude, from the same organ in an adult person.

For some time after muscular fibres are discernible in the heart, the blood-vessels have not advanced beyond being in the form of slender lines, comparable only to streaks of blood. Arteries are then merely soft, pulpy ducts; but their calibers appear to be more capacious than those of the veins. Organization, in the largest of them, is coëval with the earliest developments of the heart, in which it originates. Soon after the second month, the pulmonary artery becomes apparent; and, in a few days more, sends two branches to the lungs. After this, the vascular system in all its departments,—arterial, venous, and lymphatic,—goes on regularly and beautifully to be consummated in its ultimate proportions.

Blood, being endowed with peculiar powers inherent in its substance, has been regarded as the vehicle, at least, of a vital and energetic essence. From it, every other fluid of the animal economy is secreted, and the principles of all the solids derived:—from it, also, they incessantly obtain nourishment:—from it, indeed, every germ and fibre of every individual texture or organ that lives, is formed and regenerated. Being, therefore, the common origin of every structure, it constitutes the source of general health, and the source of general disease. It is truly a living and organized substance, whose formation is concomitant with that of the first of the fœtal elements. While these as yet exist in the shape of an incysted transparent fluid, a minute globule of blood becomes manifest in its centre. For a considerable time after its appearance, this globule never ceases to gain progressive augmentations; and, when the circulation

is perfectly established, it begins receiving an admixture of the maternal blood, which is continued till birth, when all the infant's conditions undergo important changes.

During the earlier days of foetal life, what occupies the place of brain is only a drop of whitish liquid, wherein no trace whatever of organization can be detected. At the end of eight weeks, its fluidity has sustained little alteration, and it issues freely through a puncture made in its membranous capsule. Even in the fourth month, it remains soft, and may be evacuated with the application of very slight pressure. It has obtained some degree of firmness, in another month; and, then, resembles a tremulous mass of jelly. At this period also, its internal membrane* may be recognized, and likewise its separation into two lobes:—but, otherwise, the whole cerebral pulp is white, uniform, smooth, and quite destitute of the convolutions by which, in maturer life, it is particularly characterized.

About the eighth month, its consistence has increased; and, from the distribution of its growing blood-vessels, its interior substance procured a reddish hue. Its external surface is still white, and the investing cover adheres more intimately to it. Several of the brain's longitudinal depressions now appear; but they are, at first, very su-

* Anatomy describes the capsular envelope of the Brain as being composed of three separable coats or membranes. These are, the *external*,—that placed in apposition to the inner surface of the skull:—the *internal*,—that which lies in contact with all the circumference of the brain itself:—and the *central*,—that interposed between the two former:—it is remarkable for the beauty and delicacy of its texture:—anatomists call it the “arachnoid membrane,” from its exquisite thinness and resemblance to a spider's web.

perficial:—they grow deeper and more numerous as the new being approaches maturity. At this time, moreover, the different parts which constitute the base of the brain become more distinct and consolidated. Towards the close of the ninth month, the cerebral convolutions have greatly multiplied. What of the organ goes subsequently to be ash-coloured, now commences assuming that tinge. The small brain,* the oblong brain, and particularly such points as correspond to the origin of nerves have, by this time, attained a remarkable degree of firmness, while the lobes of the brain itself and the whole of its convex surface remain very soft and flexile.—Until the sixth month, the spinal marrow remains a pure fluid; but the nerves, in general, keep a more advanced stage than the brain, which is the least perfect of all the vital organs, at the period when the foetal state terminates.

Among the assimilative, digestive, secreting, and excreting organs, the stomach, alimentary canal, liver and gall-bladder, and the bladder of urine, may be comprehensively noticed.

When the new being has existed ten weeks, its stomach and intestines generally present the appearances of a long thread, several times redoubled upon itself. Not long after this, however, their developments make great progress; and, in the fifth month, the bowels them-

* Within the skull is contained the great medullary mass that forms the reputed centre of the nervous system. This mass,—named in general terms the brain,—admits of three natural subdivisions:—the brain proper, which is by much the largest and uppermost: the cerebel or small brain, placed in the inferior and back part of the head:—and, the oblong brain whose position is intermediate to the last organ and the cervical extremity of the spinal marrow, wherewith it is continuously adjoined.

selves are five feet long. They are lined with a whitish deposition:—this is bland and insipid; but it very soon becomes greenish and bitter as bile. Towards the end of the sixth month, meconium* begins to be found, but in small quantity, in the lower bowels:—in the seventh and eighth months, its accumulation is rapid;—and, at birth, it nearly fills the large intestines.

Soon after the heart, the foetal liver becomes visible.—Originally a fluid, it slowly and progressively increases in consistence. About the tenth week, it occupies almost three-fourths of the abdominal cavity, and bears much resemblance to the cortical structure of the brain, in an adult. Its lower margins, in the sixth month, have descended so as to be nearly under the navel. Between the seventh and eighth months, it is full-grown; and, by the end of the ninth, the solidness of its substance greatly advanced.

At first, the gall-bladder contains only a small quantity of serous fluid, which is slightly reddened. This des-

* Meconium is the first fæcal substance formed in the bowels of unborn children.—This matter is generally greenish, frequently yellow, sometimes party-coloured; and may, probably, be a residual formation from a particular fluid, secreted by the gullet and stomach, at whose lower outlet it ceases to be transparent. It resembles jelly, is very viscous, and intensely acid. Conjectures have been advanced, of it undergoing certain chemical changes, before passing into the small intestines. There, the bile and pancreatic liquor are superadded to it; when, by the inexplicable processes of foetal digestion, the composition is made to furnish a peculiar kind of chyle, leaving the innutritious particles which form the meconic mass, to descend into the large bowels and be rejected after birth. The mother's milk is the natural and, consequently, the best agent for procuring its expulsion when too redundant.

cends into the higher portions of the bowels, and grows white, as it is diffused over their inner surface. By the eighth month, this liquid is abundant, and has got a yellowish tinge, with a bitter taste. It becomes true bile, in the ninth; and is distinguished by its yellowish-green colour and the intensity of its bitterness.

Notwithstanding its organic developments are completed betimes, the bladder of urine does not, during the foetal age, begin exercising its appropriate functions. Till the ninth month, it exhibits no trace of the fluid whereof, through future life, it never ceases to be the receptacle. Then also the kidneys, though comparatively large, are knobby and divided into many lobules. The capsules which surmount them, have not yet gone into their triangular shape. Each of them, during all the foetal months, possesses greater dimensions than its corresponding kidney. They include a considerable quantity of reddish liquor having, in appearance, the nature of gelatine.

Behind the breast-bone and between the separated layers of the partition which divides the chest into two distinct cavities, is situated a soft, pale, lobulated gland, whose uses are only conjecturally described. It becomes discernible in the second month of foetal existence, and proceeds enlarging to a size apparently excessive. It is usually replete with a thin, whitish fluid, indistinguishable in its external qualities from chyle. This gland rapidly diminishes, with the progress of infancy and childhood; and, in many instances, disappears altogether in after-life. This circumstance has led to the supposition of its having a function adapted to some peculiarity of the foetal economy; but, beyond a variety of speculative notions, little has been ascertained regarding the express

purposes to which, beyond all doubt, it is most wisely appropriated.

Such, then, is a descriptive sketch,—abrupt indeed and imperfect,—of the primary appearances in several of Man's more important organs. They all exist in the first minute germ of his material essence:—they are not consecutive in the order of their formation and development:—they are all coëval, and only come under the physiologist's observation, sooner or later, according as their nature is adapted to the reflexion of light. Originally imperceptible, the new being, by regular progressions, becomes apparent,—manifests the possession of vitality,—obtains important accessions of growth and activity,—and in the end, acquires the power of discharging functions requisite to the circumstances of its unborn conditions.—All these functions are characterised by interesting peculiarities.

Fœtal existence is altogether vegetative. During that state, the forming body continually appropriates, from the blood transmitted to it by the maternal vessels, such organizable or nutritive particles as are suited to its nature. Participating in general life, it has also a peculiar life independent, to a certain degree, of the parent's. Its organs of sense are quiescent:—its functions of respiration, assimilation, and digestion, remain inactive:—most of the secretions are suspended. Nevertheless, it lives, and grows, and moves:—it feels wants and experiences desires; and, in the exercise of instinctive movement, expresses impatience of external impression,—manifests consciousness of individual entity.

That curiously fabricated product of vital action which, growing with its growth, connects her offspring with the parent throughout the fœtal epoch, constitutes the inter-

mediate vehicle whereby materials for the development of its organs are provided:—but, what peculiar qualities these materials combine,—and how they themselves are elaborated,—and how they fulfil their appropriate purposes,—have not hitherto been satisfactorily ascertained. Since, then, the mother transmits to her unborn offspring its nutritive elements, the nature and supply of these must necessarily affect its modes of existence:—when they are sufficient and salutary, its growth will make favourable advancement;—but, when they become defective or ungenial, the new being will be imperfectly nourished,—will cease to grow,—will be brought into danger of dying. In like manner, the mother's imagination may affect her immature progeny:—thus, also, sudden terror, violent passion, or immoderate joy contributes to intercept the progress of its organization; and, in some instances, even to occasion its death. Physical causes:—blows, falls, effects of certain medicines, unsalutary food, may produce the same results:—because, in this way, they injure, in the transmission, the nutritive materials of the foetal being. When, moreover, the mother has suffered from a contagious disease, her future nursling has been known to retain indications of having been similarly affected:—thus, the perfection of foetal life is evidently dependent on the maternal.—Facts of this kind are usefully recorded, when they impress on the minds of mothers, the importance of endeavouring to maintain, at all times and with the most assiduous care, the utmost attainable health of their constitutional, and the best possible government of their moral nature.

Numerous observations have been collected by careful inquirers, for the purpose of determining what should be regarded as the average length of the foetal body, at dif-

ferent stages of its growth. From comparison of their results, it may be stated, that its length is nine inches and a half, in the fifth month;—twelve, in the sixth;—fourteen, in the seventh;—sixteen, in the eighth;—and eighteen, when its infancy begins. Several instances are recorded, however, of its then being only between thirteen and fifteen inches long:—while, on the other hand, it is not unfrequently twenty-one,—rarely twenty-four,—and still more rarely twenty-five inches in length, when this period arrives.

Similar modes of calculation have been adopted, with the object of ascertaining the mean proportion* of the fœtal weight. This is estimated by many experienced ob-

* The subjoined Table will contribute to illustrate this interesting subject. It is the result of a course of comparative observations instituted by the Governors of the hospital La Maternité in Paris, with the object of determining the average weight of new-born children. These observations were made with the greatest possible care and accuracy; and, of the weight of sixteen hundred infants admitted into that asylum, the following is a synoptical view:

TABLE.

Sixteen new-born children,—each of whom weighed.....	9 lbs. 13 oz .
One hundred.....	8 3
Three hundred and eighty.....	7 12
Six hundred and sixty-six.....	6 12
Three hundred and eight.....	5 12
Ninety-seven.....	4 8
Thirty.....	3 14
Three.....	2 8

On this Sketch, it may be proper to remark, that the greater proportion of these are the children of females who live in abject poverty, or addict themselves to all kinds of irregular habits. This must necessarily become a direct cause of their being less in size, lighter in weight, and feebler in constitution, than the offspring of parents placed in the more favourable circumstances of society.

servers as varying from eleven to twelve pounds, in a well-made infant at the time of its birth:—it is considered as generally ranging between six and seven and a half, in the opinion of others. From extensive researches instituted in one of the continental hospitals, one hundred ounces was found to be the average weight of twenty thousand infants, all healthy and well-formed. A small number of these weighed twelve and a half, and a few only two pounds. Some new-born children have been known to be sixteen;—almost all the individuals of two large families were more than fifteen;—my own experience has furnished me with examples of two infants who were nineteen, one who was twenty, and another who had two teeth and was twenty-two pounds, at the time of their passing from the foetal state.—Such facts are curious:—they may afterwards come to be useful illustrations of the natural history of man.

INFANTINE STATE.

AT the Infant's birth, all its organs are placed, for the first time, in relation with external objects, *from* which they receive impressions variously modified, and *on* which they re-act with different degrees of energy. Two new forms of vital action are now superadded to those it formerly possessed. Its lungs, which were inactive during the foetal state, experience a sudden expansion from the introduction of atmospheric air, and forthwith begin to exercise their incessant functions,—respiration and the processes of reproducing an animative principle in the blood. All communication with the mother, at the same time, ceases;—the sanguineous circulation undergoes a remarkable change;—the heart's activity increases;—the

liver's preponderancy in the system imperceptibly but certainly declines:—and, the foetal modification of existence gives place for ever to that on which the new being has just entered.

Ceasing any longer to receive caloric from its parent, the infant acquires the faculty of generating vital heat:—it manifests a desire for aliment, by means of instinctive signs:—and, immediately on imbibing the maternal milk, its digestive organs commence assimilating the nutritious particles of this natural food. It sleeps much, but its slumbers are short and have frequent returns. Alternations of sucking and sleeping indeed, constitute its principal employment during the earlier months of the infantine state.

New-born children, it has already been said, measure from eighteen to twenty-four inches in length, and are from five to twelve pounds in weight: but, in the results on which rests the foundation of every estimate of this kind, there must necessarily be many variations. Such of them as are large and seem strong at birth, do not always prove to be the most active or the most robust. From the pliability of their constitutions under the ever varying circumstances of life, many feeble and puny children are known to have attained a very advanced old-age. Observation, tradition, and history, enumerate abundance of instances, whereby the accuracy of this statement is demonstratively confirmed.

Several manifest differences,—which may be considered as in some measure characteristic,—can be observed in male and female infants, at the time of their entering into the second epoch of existence. These differential qualities will become more appreciable, when placed in a comparative arrangement.

MALE INFANTS have the

Head larger and rounder; its hind parts often more elevated; and the vertical somewhat flattened;

Chest longer, and with more of the conic form; the ribs discernibly thicker and prominent;

Belly having a particular appearance of fulness in the lower half of the back and loins, extending anteriorly from either side of the spine;

Superior extremities longer; shoulders much more raised and powerful; the arm tapering towards the elbow; the fore-arm fleshy; the hands of greater length; the thumbs larger than the fingers; and the ends of these not so regularly tapered;

Inferior extremities proportionated to a narrower pelvis,—*the bony cavity which bounds the lower part of the belly*,—the thighs smaller and less flabby; feet longer; and the heels projecting to a much greater extent.

FEMALE INFANTS have the

Head smaller; its shape more oval; its posterior regions much less raised; and the upper more spherical;

Chest shorter, and more capacious; below the fourth rib, straiter and less conical in its shape; less prominent, and farther distant from the pelvic bones;

Belly beginning higher up; and, in its inferior compartment, more tumid;

Superior extremities very generally shorter; the shoulders not so high, and corresponding to a more confined chest; the arms not so much rounded; fore-arms less muscular; wrists smaller; thumbs better proportioned to the fingers, the ends of which are fine and more delicately formed;

Inferior extremities adapted to a more ample pelvis; thicker at their upper ends, and gradually tapering towards the knees; and the heels having less projection.

From the commencement of infantine existence, arterial blood,* having begun to flow with new-born energy

* Arterial Blood has a bright scarlet colour:—it supports life and furnishes the material principles which make and maintain every part,—solid and fluid,—of the living body. When blood is abstracted from the temples, with a lancet, it issues out of a punctured artery, and springs in regular and successive jets corresponding in time to the heart's pulsations.—Venous blood, on the other hand, is purple or crimson, and flows in a continuous stream when a vein in the arm is opened:—it has expended its arterial or vital properties in passing through the arteries and undergoing the action of other vessels, named lymphatics, which apply the nutritive particles of blood to their ultimate purposes. The veins convey it, in this inert state, to the heart whence it is sent to the lungs and there, by an admirable process in which atmospheric air forms a chief agent, its arterial qualities are reproduced. From being

through all its vessels, transmits heat and life to every portion of the animal economy. Then, also, the biliary organs proceed in the active discharge of their functions; the effects of which exhibit themselves in a slight yellowness gradually diffused over the general surface:—all the fluids acquire a great degree of vitality, sapidness, and odour, which goes on increasing with the infant's age:—the gelatine in the system becomes albumen, then fibrine:—and, all parts of the body, by an imperceptible progress, are gradually consolidated. Immediately, therefore, on being placed in a state of independent existence, the infantine frame enters upon the performance of those vital actions from which result its gradual enlargement and conformation, till the animal economy, in all its branches,—solid, fleshy, and fluid,—acquires the measure of strength, beauty, and perfection, the constitution and temperament of each individual capacitate it to attain.

Beings newly born seem not qualified, till after an uncertain interval, for exercising the functions of sensation,—vision,—hearing,—smell,—taste,—and touch:—the degree of advancement, these have attained in primeval infancy, merits a cursory glance.

Notwithstanding,—as experiments have shown,—the eye, in infants, is perfectly formed and capable of admitting the impressions of light; yet, for many days, they do not exhibit manifest signs of enjoying distinct vision.

About the fourth day of their age, they begin to smile and to recognise their mother, and thereby evince the first sign of possessing intelligence, that exclusive and sublime inheritance of the human race,—for, to smile or

revived by this important change, it passes into the posterior side of the heart, which forthwith sends it again on its circling course.

laugh denotes the knowledge or certain perception of what imparts satisfaction and delight to rational creatures. Originally, their eyes perform slow and irregular movements; and, even at the seventh week from birth, are affected only by the influences of strong light. When they have acquired the power of perceiving bright objects in common sunshine, they still remain incapable of distinguishing them. Red and lively, or dazzling colours first engage their attention:—ultimately, they learn to discern bodies, but have no idea of size and distance. They stretch out the hand to seize indiscriminately what may be near or remote; and, as their chief desire is the acquisition of nourishment, they carry all things to the mouth, whatever be their dimensions. Thus, vision is very imperfect in early infancy, but progressively improves by experience.—Persons who assert that infants see objects double, or reversed, or smaller than is natural, state a hypothetical assumption which no fact has yet been discovered, either to elucidate or confirm.

Unlike the eye at birth, the ear has not attained its ultimate modifications, and its external passage is almost filled with a substance, in many respects, analogous to that which covers the skin; consequently, for some time afterwards, this organ seems nearly insensible to sounds of any kind. At a later period, the infant begins to give evidence of being affected by loud and sharp noises; but a long time elapses before it becomes able to judge rightly of the intensity or direction of sound:—it is still longer ere it can distinguish the variations of articulated tones. Vivid light, at this period, pleases the eye; sharp loud sounds, the ear.

Equally with those of hearing, the organs of smell are imperfectly developed, in the first days of infancy:—their

functions, therefore, cannot be usefully exercised. With equal steps, however, the latter acquire their relative perfection, and the former advance to maturity. By reason of the nostrils being as yet defectively formed and their cavities nearly obstructed with mucous matter, the acts of breathing are, at this period, chiefly maintained through the mouth.

Whether taste be possessed by the new being, during its foetal age, remains to be determined:—but, it is certain, that recently born children have the power of exerting it, with some degree of activity. Although their tongue, palate, and mouth be almost constantly inundated with salivary and glareous fluids having a tendency to deaden their faculty of distinguishing the relish of sapid bodies, yet they readily display indications of repugnance to what is unsavoury. This fact may be proved, by placing bitter or saline substances on their lips or tongue.

Children just born seem to be incompletely endowed with the sense of feeling, or rather of perceiving by touch. It ripens, however, with age and the progress of its organic maturity.—It is not the impression of atmospheric air that occasions the crying of infants, at the moment of their entering into a new state of being:—such cries constitute the manifestations of their instinctive efforts at bringing the lungs to perform those actions, in which the vital process of respiration consists.

At birth, the colour of the infant's body is bluish-violet:—it changes into a beautiful red so soon as respiration has influenced the blood now circulating through its vascular organs:—the blood-vessels of its skin form a very fine lace-work, which gives it a pleasing and elegant appearance:—it is, moreover, very soft and delicate,

and exceedingly susceptible of external impressions. Both these circumstances,—the colour and sensibility of the surface,—depend on the ascendancy, in size and activity, of the vascular and nervous, over the other systems. From the same natural causes also, proceed that freedom and velocity of the blood's motion, denoted by frequency of the pulse, which is peculiar to the infantine state:—hence, too, the rapidity of the processes of secretion and excretion:—and hence, the comparative excess of their results.

At the dawn of infancy, the body is every where extremely tender:—bland and insipid juices replenish the interstices of its various textures:—the whole animal fluids, indeed, have not at this period changed their more mild and watery qualities for those which they assume in after-age. An irregularity in the soft parts is also evident: it arises from the superabundance of their cellular substance. All the muscles are soft, indistinctly marked, and less powerful in their actions. At this time likewise, the bones have not attained their perfect formation:—they are still spongy and yielding;—their ends and edges cartilaginous;—their upper edges unduly large;—and, their articulations deficient in firmness. Some of them, as yet, consist of separate portions,—the breast-bone and others,—which ultimately unite, as the organic fabric approaches its completion.

Frequently the breasts,—the male as well as female,—are distended with a whitish lymph resembling chyle or milk, which ignorant and officious persons sometimes forcibly express; and, in this way, unconsciously inflict very serious injury on these delicate organs and the babe's general health.

Although its organic textures be defective in strength,

and the external senses inactive and imperfectly developed, yet the infant is pre-eminently endowed with the nervous power. In this originates its great proneness to being affected with uneasiness or pain by the slightest external causes:—few or none of its diseases indeed are unaccompanied with nervous excitations. That largeness of the head;—that extreme irritability of fibre;—that perpetual restlessness and mobility of the child which make it pass so suddenly from crying to smiling or laughter, and from one affection to another:—that extraordinary “impressionability” so peculiar to it,—all demonstrate an excessive ascendancy of the nervous system, during the infantine state. Every thing in the babe is fraught with feeling:—every thing conspires to give its whole organic nature the most sensitive energy. From this source proceed the dispositions of its intense and feverish life; from this, its rapid growth; from this, its impatience of restraint; and, from this, its frequent need of nourishment and repose.

The first natural motives to action, in infants, are neither reflected nor produced by feelings communicated through the external senses. They arise independently of the necessity of thinking, willing, or judging, and emanate solely from that instinct, that internal impulse which awakens and maintains in every living being, the desire of self-preservation. This force, or faculty of its vital nature which impels the babe to search for its mother's breast and to suck it, is quite identical with the power that teaches the lambkin to recognise its dam in the middle even of a numerous flock,—that instructs each individual of the graminivorous tribes to distinguish and select from among the herbs of the field, those most appropriate for its own subsistence, and to reject with unerring

discrimination such as possess insalutary or deleterious qualities.

Instead of having a greenish or golden colour, the bile of infants is reddish and destitute of the intense bitterness by which it comes afterwards to be characterised. The urine is less acrimonious, and has not yet acquired its peculiar smell:—the dejections, also, exhale a fainter odour. More of the nutritive principles of food is then assimilated and deposited in the chyle; and the blood, being free of biliary particles, has less pungency. It also contains a greater proportion of the organizable matter, destined by an all-wise Providence for the support and progressive increase of the child's vitality and structural formations.

About the fourth month after birth, various symptoms denoting an acceleration in the progress of the first teeth toward their final development, come under the mother's notice. These also are frequently accompanied with more or less disturbance of the infant's general health and an exaltation of its nervous sensibility. While exposed to many accidents arising out of this state, its feeble machine nevertheless continues progressively to increase in size and firmness. By degrees, it has come to be capable of standing and of walking,—of distinguishing the forms and external qualities of objects, by the hand, the ear, and the eye,—and of expressing, by a diversity of vocal and physiognomical signs, its sense of disinclination, aversion, pain, or desire,—of gratitude, persuasion, satisfaction, or delight. With its advancing days, its muscular system acquires greater vigour and power:—its movements become more certain and subject to the influences of its will:—and, dentition and ossification make advances proportioned to the quantity of the chief constitutional

elements of teeth and bone, furnished by the nourishment on which the child is made to subsist.

Right judgment of things depends very much on the equal development of the double organs of the external senses, and of those through which the manifestations of mind are exhibited,—the two hemispheres of the brain. Hence proceed, the manifold injuries inflicted by injudicious compression of the infant's head. Inconvenience, also, often arises from habitually giving too great a preponderance to one side of the body:—by such practices, the other side is made to remain feeble and defective in power. In like manner, an ear or an eye becoming stronger than its fellow by means of vicious customs, renders the senses of hearing or seeing unequal,—however simultaneous they may be,—and thus gives rise to false or inexact ideas of things. From this source originate squinting, and all the degrees of oblique vision. By such means also, the ear is made incapable of accurately perceiving the symphony of tones,—of understanding music,—and, of singing with correctness. Nevertheless, children in the cradle, who can listen to the lullabies of their nurses, soon get accustomed to the rhythm and cadences of song. Sweet and melodious tunes withdraw their attention from what distresses them,—regulate more equally their organic movements,—inspire them with gaiety and innocent joy,—and lull them into sweet and refreshing slumber. By observation of these natural circumstances, some ancient philosophers were led to regard Music as contributing much to the health, the growth, and the vigour of infants;—as capable of removing disease;—and, of maintaining the harmony of the soul.

Between the second year,—when the organization and

arrangement of the first set of teeth are being completed,—and the end of the seventh,—by which time the second dentition has begun replacing the former,—all the infant's nutrient and relative functions experience corresponding advances. During this short but, to it, important period, the bones have gradually become firmer and more inflexible;—the muscles attained many fresh accessions of strength and locomotive energy;—all the members acquired greater symmetry of proportion, and greater distinctness of form;—and, the sentient as well as perceptive faculties made considerable progress in the perfecting of their natural powers. In this remarkable manner, the child gains the capacity of thinking, and speaking, and acting; and, it now exercises, with varying degrees of propriety, these invaluable functions. At the termination of infancy, therefore, many circumstances may be ascertained as combining to form indications of the child's rising character;—and the peculiarities of these circumstances should be regarded as modifying its susceptibility of moral and intellectual discipline.

CHILDHOOD.

CHILDHOOD succeeds the state of infancy, and embraces the next seven years of life,—an interval during which nature vigorously maintains the processes already in operation for conducting the young person's organization to its maturity. Early after the establishment of this epoch, the permanent teeth complete their final developments, and rise into the positions they are destined to occupy, till displaced by accident, by disease, or by senile decay. Ossification continues advancing in every part of the system:—all the bones progressively increase in size and

firmness:—those of the face, especially the nasal and maxillary, take their ultimate forms and thereby contribute to impress on the countenance its characteristic features:—and, the sutures* of the skull rapidly become consolidated. Every where, the tendons and muscles acquire condensation and strength:—the glands, particularly those in the groin, the neck, and angles of the jaws, sustain considerable enlargement:—and, a revolution in the general economy is gradually induced. For this reason, the child's nourishment ought to be adapted to the promotion of its requisite developments. If, at this time, its sustenance be inadequate, or inappropriate, or insalubrious, these natural changes will not be perfectly elaborated, and the young one shall incur the risk of being deformed through life. This indeed is the critical period, when curvatures of the spine and gibbosity of the chest, are often produced in feeble individuals:—when rickets begins its insidious and enervating ravages, and sometimes spreads with great violence, causing projections and incurvations of the limbs and arms:—and, when the scrofulous poison not unfrequently contaminates the system, by affecting indiscriminately all its structures and organs.

* Sutures, in the bones of the skull, are so denominated by anatomists from the resemblance the variety of articulation formed by them bears to a seam. The margins of these bones, which are six in number, exhibit an irregular and indented appearance, at their joinings. They are of two kinds,—the *scaly*, where the edges of coalescing bones have a simple line of union, being merely laid over each other like the scales of ancient armour,—and the *serrated*, where the osseous fibres of one bone intermingle with those of the opposing bone, forming an irregular serrated line, such as results from the intersertion of the teeth of two common saws,—from which circumstance the figurative name is derived.

Young children often exhibit very singular proofs of the strength and activity of their memory. They learn a multitude of things with astonishing rapidity; and impressions made in infancy are sometimes so profound as to be retained through all the subsequent stages of life. It is different with old persons, who generally forget, the next instant, what they have just been taught to know. Judgment, however, is incompletely expanded in the young intellect. This faculty, being altogether distinctive, requires a great assemblage of ideas,—which are the fruits of experience,—for the purpose of enabling the mind to compare their mutual relations,—to examine their essential resemblances,—and to discern their characteristic differences. Children, moreover, are exceedingly volatile, quite inconstant, very little susceptible of continued attention and of that cool reflection which the right exercise of judgment and correct reasoning indispensably requires. General maxims and all kinds of abstract principles are, by necessary consequence, quite beyond their capacity, quite foreign to the simplicity of the mental images afforded by their narrow sphere of observation:—their regard is more particularly engaged by physical objects, by things which strike the senses and not by speculative and philosophical considerations. The velocity and sprightliness of their movements,—corporeal and intellectual,—have been considered as being in some way connected with the heart's vigorous action, and the impetuosity of their circulation which causes the blood to stream rapidly through their arteries. A similar vehemence impresses an intense and remarkably variable character on all their affections:—hope, fear, joy, grief, anger, jealousy, love, hatred, and other passions arise suddenly and subside quickly, and thus powerfully though

temporarily agitate their vivacious natures. Almost all their emotions, too, are warm, gay, expansive, and conduce in a direct manner to facilitate the internal operations of life:—the very transitoriness of juvenile passion prevents it from proving injurious to health.

Female children arrive sooner than the male, at the point of their physical and moral maturity. In accounting for this fact, it has been referred to the circumstance,—of less nutrition and solidity being requisite to the completing of their organic formation;—of the lively sensibility of their nervous system determining greater activity in the progress of their growth;—or, of their persons having naturally more delicacy, their fibres more tenuity, and the texture of their organs a smaller proportion of closeness and strength.

Some shades of difference in the natural characters of the sexes, may be perceived by attentive observation. Young females are usually more delicate and slender, softer and fairer, than boys. In them, the hair grows longer and finer:—greater flexibility of the muscles seems peculiar to them:—their skin is paler or whiter, their complexion fresher and more mellow. Girls generally manifest a taste and partiality for sedentary pursuits:—they prefer the less noisy amusements, and those gentler occupations which are better suited to the female temperament and destiny:—they have more tenderness and affection than their brothers;—they commonly possess more ingenuousness, docility, and quickness of penetration:—their organization advances with great rapidity and is sooner completed:—and, their moral as well as physical sensibilities are more excitable.

As the conclusion of childhood approaches, a remarkable augmentation in the size of the small brain takes

place:—in infancy, it was as one to seven; now, it is as one to five comparatively with the proper brain. By this change of the organ's dimensions, the prominent portion of the hind-head is rendered more apparent. At the same time, the nape of the neck enlarges; and the dispositions of the young person's moral and intellectual natures assume a particular determination.

Farther alterations in the parts which constitute the glandular system,—both external and internal,—commonly accompany the organic advances of this epoch. The cellular texture also grows firmer,—contains a more compact substance in its interstices,—and gets a yellower colour. An abundance of the perspirable matter and occasional returns of hemorrhage, especially from the nostrils, testify the activity and vigour of the capillary vessels, and the strength of the heart's impulse.

The various features of the face, now passing into their permanent shapes, impart to it a new expression. In many instances, the neck becomes distinctly thicker; and the organs it comprehends, undergo analogous changes. These changes are more particularly discernible in the immediate organs of voice,* which experience greater

* Voice is formed by the *larynx* or upper portion of the wind-pipe, aided by its muscles and other appendages:—it is the sound of the air expelled through, and striking against, the sides of the *glottis* or opening of the wind-pipe into the mouth. Shrillness or roughness of the voice depends on the internal diameter of this aperture, together with its mobility, elasticity, and lubricity, and on the force with which the air is propelled by the lungs:—when, therefore, the aperture of the wind-pipe is narrow, the vocal sounds are weak and shrill; when wide and capacious, as in men, it emits deep and grave tones.

Speech is the modification of voice into distinct articulations

modifications in males than females:—in the latter, they retain nearly their primary forms.

During these stages of the individual's growth, the voice alters and emits disagreeable and inharmonious

within the cavity of the *glottis* itself, or in those of the mouth and nostrils. Many speculative explanations have been offered to the world, with the object of determining by what means the air is rendered sonorous in the wind-pipe of animals. That of Galen is the oldest:—he supposed the caliber of the *glottis* to be alternately expanded and contracted; and the idea was revived in modern times,—1700,—by Dodart who compares the action of the vocal organs to that of a flute. Ferrein supposed the variations of sound to depend upon the variations of tension and relaxation in the ligaments of the *glottis*; and, in this view, such ligaments become vibrating chords and the entire apparatus approaches the nature of a violin. These two conjectures have been united by Richerand, who regards the *glottis* as a *wind* and at the same time a *chord* instrument. Kratzenstein considers the *glottis* in conjunction with the whole length of the *larynx* as constituting a kind of drum:—and, by the venerable Professor Blumenbach the former is viewed in the light of an *Æolian harp*:—but, in the estimation of the very learned Dr. Good, all these are ingenious sports of the imagination, and contribute little to the advancement of physiological science.

The *glottis* is nearly as complicated in its structure as the eye or ear, and the modulation of its tones depends upon an equal degree of elasticity and pliability in all its movable parts, and on their perfect submission to the authority of the will. To the attainment of a correct voice it is necessary that there should be great accuracy of ear,—a perfect symmetry of the vocal organs,—equal tenseness in the ligaments of the *larynx*, which must be also nicely balanced by the powers of the muscles on each side,—a delicate adjustment of the cartilages of the *larynx*, to each other,—an equal deepness of its lateral cavities,—and a like length of the extremities of the small semilunar bone on which the base of the tongue is placed. With such a conformation of its organs, the

tones;—but, in about a year, the superior extremity of the wind-pipe,—which contributes in a chief degree to make varieties of modulation,—expands in the proportion of five to six in boys, and only of five to seven in girls. By and by, the parts attain their ultimate mechanism, and the vocal sounds become more equal, full, and sonorous; and their strength is always proportionate to the dimensions of the organs in which they are formed.

Children, about the time of their passing into the adolescent state, always discharge the processes of digestion with promptness and efficacy:—assimilation, in them, is perfect; and the desire, as well as the want, of food returns with urgent frequency. All the vital organs perform their functions with vigour and regularity. Respiration,* from the capacity of the lungs being now much

voice is perfected for exact modulation in speaking or singing; and, it is from different defects in this requisite mechanism, that some persons speak with dissonancy, and others cannot sing in tune. Thus, in the change of voice which takes place at the conclusion of childhood, every part of the vocal organs does not harmonize with the rest;—some parts become more tense, others more easily yielding,—some are more relaxed, others more contracted. A tolerably distinct idea of the effect producible by such a state of the *glottis* may be drawn from the remark,—that a variation in its capacity not exceeding the fifty-fourth part of a silk-worm's thread, or the one three hundred and fifty-fourth part of a hair will occasion a difference of tone. Time, however, and repeated exercises of the will usually triumph over these discrepancies,—in a few months, the voice recovers its unity of tone, and becomes graver in proportion to the increase of firmness and density of its motive powers.

* Respiration or the act of breathing, is more frequent in infants and children than in full-grown persons, in females than in men. During the first year of life, the chest expands and con-

augmented, and from their sustaining incessant excitement from the impulses of a profusion of venous blood going to them for the purpose of being re-impregnated with the living principle, is full and rapid and powerful.

At this time, likewise, the arterial blood becomes brighter, warmer, more stimulating, and imparts such considerable supplies of the vital and organizable principles to all the textures of the body, that it is not unusual to find some young persons growing four, five, six, or even seven inches in a year, without experiencing any important disturbance of their health.—This is the period, says a philosophical Physiologist, when we feel within us, and at each throb of our pulses, the blood penetrating every part of the system; and it is this internal feeling which gives rise to the sentiment of our existence,—a sentiment so lively and animating at the epoch when the circulation diffuses a freshness over all our tissues.

Towards the termination of childhood, a sense of restlessness and discomfort, general langour, and transient headaches, variously acute, begin to be experienced. The osseous system has now obtained many accessions of strength, the bones increase in length, and the muscles which cover them have manifest projections. From the abundance of its fibrine, the muscular system is now much more powerful. This, and all the other tissues, and all the excretions, especially the insensible perspiration in robust and vigorous persons, exhale a very re-

tracts, the lungs inspire and expire the air,—that is, the child breathes thirty-five times in a minute;—in the second year, twenty-five times in each minute;—at puberty, twenty times;—and eighteen times in the minute, throughout the adult age.

markable odour which, in some is agreeable, in others unpleasant.

Now, also, the nervous system loses much of that exquisite sensibility which was characterised, during the infantine state, by rapid and almost constant changes of movement,—by a multiplicity of momentary wishes and desires,—and by a disposition to convulsive affections. The brain, which is the centre of this system, ceases any longer to preserve its predominant size;—but, it acquires a degree of energy which increases its capacity for manifesting the propensities, and sentiments, and intellectual faculties each individual has derived from nature. Then, too, an extension of the memory, an increased vivacity of the imagination, and other new determinations, which produce tastes and inclinations hitherto unknown, all attest the general intercommunity of relation that now takes place between the physical and moral constitutions of mankind.

DENTITION,—TEETHING.

DENTITION is not naturally connected with any form of diseased condition in the animal economy:—it is by the causes only which render the process difficult or painful, that the maladies so often accompanying it are determined. It is the object of this Section, to illustrate the favourable progress of dentition by an enumeration of the particularities which distinguish,—the nature of the Teeth as organic productions;—their number and anatomical disposition;—their formation and successive developments;—and, the elementary principles of their structure, a knowledge of which suggests the means best adapted to the conservation of their health and beauty.

Teeth differ in many respects from common bone:—they are much harder, and so compact that the existence of vascularity or a system of blood-vessels cannot be detected in their structure, by which circumstance many physiologists have been led to question their being endowed with the essential attribute of organized matter,—vitality, the possession of a living principle. They are covered with a peculiar substance, the *enamel*, which is not found in any other part of the body:—they do not suffer as bone would do in the same situation, although they stand exposed to the perpetual influences of atmospheric air and the incalculable diversities of aliment:—they are not necessarily excited to diseased action, when worn by friction:—and, their mode of formation as well as the manner of their decay is altogether different from the same processes in other organs.

Human teeth, likewise, are peculiar in being on a level and more nearly of one length than is in any instance observable among the brutal tribes. In all other animals, the teeth differ remarkably in the length and size of their different classes, and they are separated by wider intervals. Another peculiarity consists in the upright position of the front or cutting teeth and the regular inclination of the lateral group, in proportion as they are distant from the centre of motion in the angle of the jaw. From their having a use in speech, the front teeth are very different in man from those of irrational animals. There is also a peculiarity in the obtuse tubercles of the side or grinding teeth, which indicates a correspondence between the teeth taken collectively, and the variety of food and the mixed diet which are natural to man.

Dental structure constitutes the compactest part of the human frame; and the uses to which teeth have been

appropriated are,—the mastication of food and a share in the articulation of vocal sounds. Each of them is situated in its own socket or hollow in the jaw, appointed by nature for its reception. The distinguishable portions of a tooth are,—the body of it, the crown or base, enamel, ivory, neck, fangs, and central cavity. The *body* is that part of it which stands on the outside of the socket and jaw; it is covered with enamel instead of the filmy membrane called *periosteum*, which envelopes a common bone:—the *crown* is the upper surface of the body, and is opposed to the corresponding tooth of the opposite jaw; it is peculiarly fitted for the office of manducation:—the *enamel* is that firm polished substance which overlays the crown and body of each tooth:—the *ivory* is the bone-like texture placed immediately underneath the enamel:—the *neck* occupies a position between the body and fangs, on the edge of the sockets, where the enamel ceases and the periosteal covering begins; it is to the neck of the tooth that the gum is attached:—the *fangs* vary, from one to four, in number; they are fixed in their sockets; periosteum covers them; those of the teeth in the upper jaw are generally more divergent and, by consequence, their attachment is firmer:—and, the central *cavity* is within the body of the tooth, and extends along each fang; it is lined by a delicate membrane on which minute blood-vessels and nerves are ramified.

Adult persons have thirty-two teeth, which are usually divided into four orders;—the *incisors* which have a cutting edge;—the *cuspid*s, or canine, or spear-edged, so named from their having one fang and the upper part of the crown ending in a point with two lateral shoulders;—the *bicuspid*s, the crown of which terminates in two sharp points;—and the *molars* or grinders, from their being a-

adapted to the process of comminuting substances by attrition.

Each jaw in its front contains four *incisive* teeth, and their crown assumes the form of a wedge, having its anterior and posterior surfaces inclined and meeting in a sharp edge. Anteriorly, the surface is convex; on the inside, it is concave. When viewed laterally, the tooth is broadest and flat near the neck; towards its upper margin, it arises in a pyramidal shape. The enamel descends farther on the side than on the back and anterior surface: the fangs are long and straight and conical, and penetrate deeply into the jaw. From their position, the upper project more than the lower incisors; and, in chewing, their edges do not meet, but pass each other so as to cut the food:—this arrangement prevents the rapid wasting of their edge that would otherwise take place.

Passing backwards, one of the four *cuspid*s is found in either side of each jaw. They have a general resemblance to the incisors from which, when their points come to be obliterated, they are scarcely distinguishable. Their fangs are longer; and, being placed in the corner of the jaw and deeply socketed, they impart strength to the front teeth. Their principal distinction is the spear-like form of the upper part of their crown.

Behind the last, in each jaw, stand the four *bicuspid*s. In these, the crown rises in two sharp points, giving them a resemblance to two of the cuspid s in a state of conjunction. Their fangs are always flatter and shorter; oftentimes, they have an imperfect division; occasionally, are double; and, oftener convex than those of the other teeth.—The second bicuspid is sometimes wanting.

In each jaw are six *molars* or grinding teeth, having their crown in the form of an oblong square, on the su-

terior surface of which are commonly four or more projections. Enamel covers them to a uniform level, and makes them an approximation to the teeth of graminivorous animals. These regular projections being overspread with enamel, a portion of it is not displaced from the depressions when the projections themselves have been worn down. This is sufficient, to a certain degree, to save the remaining part of the tooth from wasting rapidly under the frictions to which it is exposed.—Grinding teeth, in the lower jaw, have two, and in the upper, three separate fangs. Each of them may be considered as four of the cuspids intimately conjoined. The projections on the grinding surface correspond with the points on the cuspids, and the fangs with the projections of the crown; for, although there are only two or three roots to each grinding tooth, yet there would always be four fangs if they were disparted.

Mankind receive two successive sets of teeth,—the milk or deciduous, and the adult or permanent. The former includes twenty:—of these, four are incisors, two cuspids, and four grinding teeth, in each jaw. The appearances which prelude the latest stages of dentition, usually begin manifesting themselves at an indeterminate period, between the fourth and tenth months of the infantine age.

In children, the central incisors of the lower jaw are generally the first* to pierce the gum:—in a month after-

* Louis XIV. was born, having two teeth in their places. Nineteen examples of children in similar circumstances are related by Haller; and Polydore Virgil mentions the case of an infant who had six teeth at the time of his birth.—On the other hand, the first dentition sometimes does not commence till the tenth, twelfth, fourteenth, or even nineteenth month of the child's age.

towards, their counterparts in the upper jaw make their appearance. These, in a few weeks, are succeeded by the lateral incisors of the lower, and then by those of the upper jaw. Sometimes, however, the latter precede the former in the perfection of their growth. About the fifteenth month, the anterior grinders of the lower jaw elevate their white surfaces above the gum:—then, the cuspids and, in the end, the large molar teeth make themselves visible,—the inferior generally being antecedent to the superior teeth. The last tooth does not rise till the beginning of the third year of life.—This is the more regular and common order in which the teeth consecutively assume their positions in the jaw; but it is not universal. When they appear in irregular succession, it has been said, that more irritation and pain, and more of those symptoms ordinarily ascribed to teething, accompany their progress.

With the rising of the second grinder, the deciduous set may be considered as completed; for the third, being formed about the eighth year when the jaw has advanced towards its perfect form, is never shed but truly constitutes the first permanent tooth. The grinders of the adult, indeed, are properly the permanent teeth, for they alone arise in this part of the jaw, and retain their original places.

During the sixth and seventh years, the young person's jaws have so much enlarged that spaces are left between the deciduous teeth, which now begin falling out and give place to the permanent. Children, at this period, have

Van Swieten states an instance of its being so late, and Lanzoni knew the son of an Apothecary in whom the first teeth did not begin to make their appearance till his seventh year.

ceased to be any longer in a state of nature ; and circumstances, numerous and diversified, have affected their health and growth. For this reason, it happens that, in regard to time, the shedding of their teeth is by no means regular:—in certain individuals, they fall out three years sooner than others ; and, in frequent instances, some of them permanently retain their original positions. We ought therefore, to be at all times well assured of the adult tooth being in a state of progressive advancement, before that of the primary set is heedlessly extracted.

Nature has beneficently provided that, while the jaw-bones are still small, the permanent teeth should rise slowly and in succession, so as to escape being crowded into too narrow a space and, of course, turned from their proper direction. Slowness in shedding the deciduous, or a premature development of the permanent teeth, is a very general cause of irregularity in their ultimate arrangement. Commonly, the incisors of the under jaw become loose when the foremost of the secondary grinders are penetrating the gum:—the central soon after appear ; and, in two or three months more, those of the upper jaw arise. Next, in about four months, the lateral incisors give way, and their permanent successors take their places at the same time with the anterior grinders:—the lateral incisors of the upper jaw then follow ; and, in the course of another year, the temporary grinders grow loose, but the cuspids are enabled to retain their hold of their sockets for a short time longer, by means of their lengthened fangs. When the anterior grinders and the cuspids have decayed, they are succeeded, about the ninth year, by the bicuspid and cuspid of the adult set. Before the end of the eleventh year, the farthest back of the bicuspid take place of the anterior grinders, the se-

cond of which does not appear for five or six years after the permanent teeth commence occupying their sites.

Between the eighteenth and twentieth year of the person's age, the jaw acquires its final proportions:—then, also, the third grinder, or *wisdom-tooth*, ascends into its site. This is shorter and smaller and more inclined inward than any of the rest, and its fangs are less regular and distinct. From the cuspids to the last grinder, the fangs become much shorter; and, from the first incisor backwards, the teeth themselves stand less out from their sockets and the gums.

Induration* does not commence, in all the teeth, at the same period.—*Incisors*.—A portion of their crown appears in the fourth fœtal month; the bone-like structure which includes the pulp is then a line in thickness; the central are farthest advanced in their development; and, the fluid contained in the capsule has a yellow, sometimes reddish colour. By the sixth month, two-thirds of them are formed; at birth, their crown is perfect; and, in five or six months more, the central have terminated their for-

* *Induration*.—Instead of this, writers in general employ the word *ossification* which signifies the formation of *bone*, the act or state of growing into *bone*. Now, *teeth* do not in any of their component parts contain what is truly bone; their ivory and enamel are essentially different from bony structure. *Ossification*, therefore, is calculated not only to convey an *imperfect* sense of what is meant, but to express an organic process which, with regard to the teeth, is altogether incorrect, absolutely inconsistent with what takes place in nature.—It is much easier, however, to discover error in the use of descriptive terms than to produce more definite substitutes. *Induration* is employed here to denote that firmness or hardness which is peculiar to the teeth and distinguishes them from bone:—its meaning is *defective* certainly, but not *false* or expressive of what is *contradictory* of nature's course.

mation, and the lateral are far advanced.—*Cuspids*.—Their summit, in the fourth month, exhibits the first point of its induration; in the sixth the crown usually begins assuming its destined form; two-thirds of it are distinct at birth; and, when the infant has arrived at the middle of its first year, not more than two-thirds of the root has been formed.—*Small Molars*.—Their body is quite well defined, in the fourth month; in the sixth, their tubercles are visible, and in some the process of induration has evidently commenced; their tubercles, at birth, are very distinct; in the first molar teeth sometimes five tubercles become manifest, while those of the second also are well formed and conjoined at their base by a layer which is not yet perfectly indurated; by the end of the fifth month, the growth of their roots has made considerable progress.—*Large Molars*.—In the fourth month of the foetal state, the first of these has imperfectly assumed its elemental form; at birth, it possesses no trace of induration; about the end of the sixth month of infancy, the crown of the first is indurated, and the second is much enlarged.

Immediately after induration is established in the first small molar tooth, that process commences in the incisors and cuspids of the permanent dentition. It proceeds in the following order:—the interior incisor, in the sixth month after birth,—the exterior incisor and the cuspid, between the seventh and ninth months,—the anterior small molars, during the second year,—the second small molars in the third,—and, the last of the large molars, usually in the ninth.—This process always begins in the lower teeth, both of the deciduous and permanent sets.

In explaining the different parts of which teeth are composed, the enamel,—the ivory or bone-like struc-

ture,—and the central pulp,—together with a description of the admirable processes by which nature elaborates the different kinds of texture composing the dental mechanism, may be brought under consideration.

Enamel is one of the most remarkable of the animal formations:—its use is to protect the subjacent textures of teeth from the influence of external agents, and to give them strength for accomplishing the function of mastication:—it consists of radiating fibres which take a perpendicular direction from the crown of the tooth, and give it a filamentous appearance. On the surface of the roots, which are not provided with it, is a thin, yellowish, semi-transparent pellicle:—this seems to be continued over the body of the tooth and its crown between the ivory and enamel. The latter is much harder than the former, and does not, like it, become yellow under the action of nitric acid. It dissolves in the acid, without leaving a gelatinous network or residual deposition of any kind. Sometimes, it is so hard as to strike fire with steel. It does not consume so quickly in the fire, but cracks and separates like the ivory, which on being exposed to heat, blackens and burns as bone, giving out the same odour. In the remains of men and animals which have lain for ages in the earth, when the bones and ivory of the teeth are crumbled into dust, the enamel still preserves its consistence unimpaired.

Ivory of the teeth is not, in fact, a true example of the osseous texture, although their chemical compositions are nearly identical. Unlike bone, it is destitute of a cellular structure hardened by degrees in a pre-existent cartilage: it is composed of layers intimately applied over one another, successively formed and each indurated at the moment of its formation. Blood-vessels, in the opinion

of most anatomists, do not penetrate the ivory of teeth, which is not resolvable into scales or interstitial cells:—it has neither pores nor medullary matter. When a tooth is cut through, in the line of its axis, the ivory is found to have been deposited in thread-like streaks, parallel to each other, and arranged according to its external contour:—these streaks are the different layers of which the ivory is composed. When children suffer from disease, during dentition, some of the layers of their teeth acquire a colour quite dissimilar from that of the rest:—and, when a young animal has been fed with madder, at interrupted periods, its teeth exhibit layers of structure alternately red and white.

Longitudinally through a tooth, is a hollow which communicates with a very narrow canal in the fang, or with the canal of each, if there are more than one fang. This hollow and the canals ending in it are completely filled, when the tooth is healthy, with a gelatinous substance contained in a very thin membrane, which is penetrated by many blood-vessels and nerves passing from the socket into the tooth across the canals in its roots. This soft substance is usually denominated the central pulp. Although it exactly fills the whole cavity, it possesses no organic connection whatsoever with the ivory, and neither its nerves nor blood-vessels perforate its envelope for the purpose of entering into the hard portion of the tooth. The central pulp is lodged in the tooth without adhering to it; but it is connected with the bottom of the socket by means of its blood-vessels and nerves, and by the union of its enveloping membrane with that which lines the internal surface of the socket. So long then as the socket remains closed, its membrane and that of the pulp are, according to a fanciful comparison, like the two

fold of a night-cap; and it is in the interspaces of these duplicatures where the layers are deposited which ultimately form the tooth itself. Neither blood-vessel nor any nerve passes from the internal face of the socket into the roots of a tooth, so that these roots, if the pulpy substance which fills them be extracted, may be considered as being planted in the socket after the same manner as is a nail in a piece of wood.—These facts can easily be confirmed by examination of the teeth of elephants and other large animals, and still better by observation of its state at different periods of a tooth's development, which, like that of a shell, is completed by the deposition of successive layers, whereof the last formed always overlays the preceding.

Soon after the commencement of the foetal state, the embryonic elements of teeth appear in the shape of delicate cysts implanted in the margins of the jaws, and not larger in size than a pin's head. At the end of the first month, they are altogether membranous:—in another month, the separate pulps of the incisors and molars of the first set have become visible:—in fifteen days more, those of the cuspids may be perceived:—and, in the third month, the capsules of all the future teeth are manifest. At this period, they are lodged in a fold of membrane which goes, in the end, to form the gums; but they exhibit, in the end, characteristic differences arising out of their relation to the first or second dentition:—if to the former, they are immediately attached to the membrane of the gums,—if to the latter, they are suspended by a pedicle which is nearly two lines in length. When exposed to the air, at this time, they contract a yellow colour which extends to the white substance of the gums. They become an object of distinct observation in the

fourth month, when the dental pulps are entirely developed, have attained considerable firmness, and from being contiguous in their arrangement, form an uninterrupted chain. Now, also, the colour is brownish-gray, and the first form of each tooth is surrounded in its situation by a sero-mucous fluid.

Originally, each capsular membrane does not contain the germ of a future tooth; it is merely filled with a particular fluid which undergoes determinate changes. The membrane itself increases in thickness, with the advance of the fœtal age; and, about the commencement of the fourth month, the germs of the teeth begin showing themselves in the cavities of their individual capsules. At first, they are quite simple and have a round summit,—the incisors and cuspids one only, the molars two or more.

These membranous capsules are composed of two layers, named the external and internal. The *external* is fibrous, opaque, and whitish:—it lines the inside of the socket; and, at its bottom, adheres closely to the blood-vessels and nerves of the central pulp. It also compresses the fluid contained in the internal layer;—this is known by an incision being made in the former, when the latter instantly protrudes in the form of a minute swelling, through the aperture. The *internal* is more vascular than the common *serous* membranes, and the fluid which it contains is more viscid:—it is distinguished from the *mucous*, by the absence of follicles in its structure:—but in some respects, its characters approach to those of the *synovial* membrane. It has an intimate connection with the external; but is redoubled over the vessels and nerves, and then inserted in the base and inferior circumference of the pulp which fills the central cavity and is,

in no other place, covered with the internal layer of the capsule.

The membrane which incloses the fluid rudiments of a tooth, is not an integral tissue of the gums; and, although these parts seem to be intimately united, they may be separated throughout all their extent. A communication between the internal layers cannot always be found:—the external sends out a prolongation in which the capsule of the permanent tooth is developed. This capsule, from the instant of its formation, is completely closed.

Previously to any trace of the germinating teeth being observable, an indeterminate number of cavities can be distinguished in the foetal jaw. Each of these cavities, which ultimately forms one of the sockets, includes a minute gelatinous vesicle:—the envelope of this is a part of the same membrane that lines the socket itself, to whose bottom it adheres. With slow but regular advances, it becomes a vascular pulp which constitutes the mould of a future tooth and prepares, by a singular variety of secretion, the matter whereof the ivory is formed. This matter exudes from appropriate vessels in the pulp, is beautifully diffused over its determinate situation, and there undergoes the final process of hardening or induration, by which it acquires a degree of density and strength little different from those characteristic attributes of the genuine bony structure.

After a short period, some thin layers of the ivory are deposited on the summit of the pulp:—with this, however, their connection is not very intimate; they are retained there only by slight pressure of the membrane which lines and closes the socket. Increasing gradually in breadth and thickness, they progressively unite; and, in the end,

form a kind of cap whose original layers represent the tubercles of the tooth's perfected crown. Like these layers, the cap does not adhere *to*, but lies *on*, the head of the central pulp which incessantly furnishes accessions of elemental ivory, whereby the cap's thickness is regularly augmented. With the consecutive additions of such layers, which always take the shape of their pulpy mould and are compressed between it and the socket, the cap naturally becomes concave and descends all along the sides of the pulp, forming first the ivory or cylindrical body of the tooth and then its fangs.

The deposition of its constituent layers having commenced at the top of the pulp, it is there the ivory is thickest:—the body and roots of the tooth, on the contrary, are formed entirely of the edges of the latest layers which, in becoming more and more extended, become more and more thin. As the layers of ivory, moreover, are multiplied in number, and as the tooth in this manner acquires thickness,—its progressive thickening advances from the external surface which is first formed, towards its interior centre, every recent layer being deposited on the internal surface of the antecedent one,—the vascular or central pulp sustains an increasing degree of compression by means of which its dimensions are greatly diminished, so as to render it much smaller in the perfect teeth of an adult person than it was during the primitive stages of life.

When the central pulp adheres to the bottom of the socket by a single point only, the layers of ivory secreted by it are elongated over that point alone:—they inclose only one production of the adhering point; and, by consequence, form no more than one tube or fang or root of the tooth. If, on the other hand, the pulp is attached

to the socket by several points, when the deposition of ivory* matter has reached its base, the forming layers penetrate between the adherent points, envelope the very extremity of the pulp itself, and, by thus prolonging themselves, complete as many fangs as there are points of adhesion.

Each layer of ivory, immediately on having exuded from the pulp, goes into the state of its ultimate induration:—when once formed, it never changes:—it but obscurely possesses organic life, properly so called:—and, if it be cut or broken by any cause whatever; or, if the external air, from defect of the enamel, comes to act injuriously on its essential principles, it inevitably becomes carious, decays, and disappears. If, however, the mass of layers already made, be cracked before the tooth's organization is consummated, the lesion is susceptible of being repaired by the uninterrupted deposition of new layers, which, by caking themselves to the preceding as if they had been entire, succeed in accomplishing the original intention of nature.—Teeth, when once maturely organized, are altogether independent of the changes which may happen in the osseous system:—they invariably remain unaffected, even when all the bones have been softened by the ravages of disease.

After this mode of formation, then, the ivory or bone-like structure which constitutes the more solid part of a tooth, comes into existence. While it is being thickened and lengthened towards the fangs of each tooth, it is gra-

* *Ivory*, in this place, is used as an adjective noun, and signifies of or belonging to, or consisting of, the substance so denominated.—Our language wants a regularly constructed word having this signification.

dually covered with the enamel, by means of another and peculiar exudation furnished by the approximate surface of the corresponding socket:—it follows nearly the same progress as did the ivory, in respect to its breadth but not to its thickness. With regard to the latter, it arises neither from consecutive layers nor from a succession of depositions; but, when each point acquires its full proportion of enamel, it obtains it all at once and is thus perfected. Enamel, in this manner, first overspreads the primary, and then the subsequent layers of the ivory, as each consecutively extends beyond the preceding:—it is distributed to them by drops which, in hardening and mutually compressing one another, produce the perpendicular filaments whereof pure enamel consists. When once an enameled part of the tooth has arisen above its socket, it receives no more supplies of that substance, because it ceases to be included within the membrane which elaborates its elementary particles. Ivory, on the other hand, may always, while the tooth continues growing, obtain augmentations; because the vascular pulp which provides its layers still remains in its centre. This is the reason why enamel, when it has been completely formed, cannot be reddened by exhibiting madder in the food; whilst, each time this vegetable is given to an animal whose teeth are growing, reddish layers may be observed in their ivory.

Neither the enamel nor the ivory of teeth possesses true sensation; but the central pulp, which is amply provided with nerves and has a nature almost as delicate as that of the gelatinous substance in the labyrinth of the ear, is endowed with exquisite sensibility. The pulp enables us to distinguish, through its insensible envelope, the differences between heat and cold, and the minutest shades in the shock imparted to a tooth by different bodies. It

is the pulp also, on its being impressed by the external air, when its ivory and enamel have been thinned or absolutely perforated by erosion, that causes the excruciating pain of tooth-ache. When the teeth are *set on edge*, this effect results from the action,—of acids, not indeed on the teeth themselves, but on the contiguous gums,—of velli-cating smooth substances, as a piece of silk or velvet,—and of grating, discordant, or stridulous sounds.

Some physiologists regard the processes by which teeth and bones are formed, as being identical. Each, however, exhibits several essential differences by which it is characterised. The pulps of the germs of teeth neither have the same colour nor the same consistence as cartilages; neither do they undergo the true osseous transformations. Enamel is a genuine secretion from the pulp; the bone-like layers of teeth are deposited over each other, and nothing analogous to fibres or rings, as in bone, has as yet been discovered in them. The fluid contained in its dental capsule has no connection with the formation of the tooth:—it merely changes its colour while the latter is being formed, and diminishes in quantity as the fang advances to its perfect structure:—the fang increases, indeed, by a similar mechanism as the tooth itself; but the colour and nature of the elementary secretion are changed at the time when the crown is completed.

When induration has extended, on the outside, to the neck of a tooth with more than one fang, the process becomes more active in the inside. The centre of the crown, till then concave, acquires an increase of development; its margins give out indurated layers corresponding to the number of its future roots; similar layers, originating in the central parts, unite with the former; and the conjunction of these results constitutes the fangs. The

peculiar hard substance of a tooth is not formed *in*, but *on* the dental germ; its external layers come first into their place; and its constructure is produced by successive depositions of them, the recent being always deposited on the internal surfaces of the preceding.

The fluid contained in the dental capsules has been chemically analysed. It is limpid, insipid, inodorous, mucilaginous, and so acid as to change blue vegetable colours into red. From its having no tendency to render lime-water opaque, it is regarded as being destitute of phosphoric acid; but it combines a certain proportion of tartaric or lactic acid, a little albumen, phosphate of lime, and some of the muriates and sulphates. Acidity is more determinable in the deciduous than in the adult teeth:—the fluid of the dental capsules in a young calf was found to be quite alkaline; it was saturated with phosphate of lime.

Chemists, in examining analytically the composition of teeth themselves, have found,—that, in their bone-like structure, they consist almost entirely of carbonate of lime, with a smaller proportion of animal matter, and a much smaller of phosphoric acid;—and that, in their enamel, they are almost solely composed of phosphate of lime, with a minute proportion of animal matter, and scarcely any whatever, if any, of carbonic acid. Observation of these facts renders it manifest that the oxalic, sulphuric, tartaric, and succinic acids, which precede the phosphoric in their affinity for lime, will act most injuriously on the teeth. Hence, although it be very probable that a tooth, sound in itself and soundly fixed in the gums, is not decomposed by the application of any given substance, as it is out of the body, yet there are daily proofs of that law of affinity in respect to several of these acids

actually holding; and, that teeth, while in the living sockets, are greatly injured by their frequent or habitual use. It may be well, therefore, to bear these remarks in mind, when framing the composition of tooth-powders containing acids of any kind. For such purposes, then, oxalic, sulphuric, and tartaric acids ought, at all times to be sedulously avoided in the preparation of dentifrices; and cream of tartar which enters so generally into their composition, should in like manner be rigidly proscribed. The acids which have the least chance of doing mischief, from their very slight affinity for lime, are the citric, benzoic, acetous, and boracic;—yet even these have a stronger attraction for lime than the carbonic; and, for this reason, whenever teeth are deprived of their enamel, or the naked fangs become exposed by a decay of the surrounding gums, the use of these also should be discontinued.

Teeth finish their organization before the sockets, and are as it were the moulds from which they take their shapes. Between the incisors a fibrous partition becomes perceptible; about the fifth month before birth:—this, in sixty days more, acquires the firmness of foetal bone. In the jaws of infants is a double row of sockets; one pertaining to the primary, another to the second dentition. The last is situated on the inside of the former, and all communication between them is prevented by a bony plate. All the dental capsules in the unborn being are arranged nearly on a level with the gums; but this relative position of the parts is not long preserved:—the anterior germs gradually approximate the edge of the gums, whilst the posterior retire from it. This change, however, is absolutely passive and depends altogether on the mode, whether active or tardy, of the ossification of the jaw itself.

Additionally to that afforded them by their approximate position in the sockets, is the support derived by the teeth from their connection with the gums. These consist of an elastic, compact, vascular substance, which overspreads both sides of the socket's margins in either jaw. It insinuates itself between all the teeth, envelopes loosely their individual necks, and is connected with the body of each by means of particular and intimate adhesions. It is not immediately affixed to the jaw-bones, but to their periosteal lining, wherewith it is perfectly united. The inner and outer gums are continuous, and perforated by apertures corresponding in number with the teeth. Over them, and adhering very closely to their external surface, is a delicate, strong, uniform membrane, forming a prolongation of that which lines the cheeks and lips, and overspreads the tongue. Their chief use is to give firmness to the teeth, and to counteract the effects of their forcible contact when masticating food.—Before the deciduous teeth appear, a firm ridge runs along the gums; but this is thrown off or wasted as dentition advances:—with the rising teeth, their proper gums grow, and firmly embrace them.—When these are healthy, their gums continue firm and in close adhesion:—when diseased, the latter become loose, shrunk, and spongy.

Whatever means can be made to influence the general condition of the teeth, such always operate through the gums:—it is, therefore, by maintaining in these the just balance of vital action, by the instrumentality of adequate remedies, that the health of those can be uniformly preserved. When the gums themselves are allowed to be soft and flabby, they become subject to frequent bleedings, and the seat of much uneasiness, which may be aggravated into acute distress, unless its cause be removed.—If a

healthy tooth be implanted* in a sound jaw, the gum will

* Too much caution cannot be employed in ascertaining the health of the individual, by whom a tooth for such a purpose is to be furnished;—for, it is well known that, at the same time with the transplanted tooth, diseases of the worst kind may be communicated. Dr. Watson of London has inserted in the Medical Transactions, a most instructive case by which the dangers of this disgusting practice are impressively elucidated.—An unmarried lady, twenty-one years of age, had one of the incisive teeth in her upper jaw affected with the carious decay, arising from an unknown cause: it was extracted, and its place very dexterously supplied by a like tooth from another young woman who, upon a most rigid examination for the purpose, appeared to be in excellent health. The implanted tooth very rapidly took a firm hold, and soon bid fair to be of great service and ornament. In about a month, however, the mouth became painful, the gums inflamed, discoloured, and ulcerated. The ulceration spread very fast, the gums of the upper jaw were destroyed, and the sockets left bare. Before the end of another month, the ulceration stretched outwardly over the upper lip and nose, and inwardly to the checks and throat, which were corroded by large, deep, and fœtid sores. The gums soon became carious, several of the teeth successively dropped out, and these at length were followed by the implanted tooth, which had hitherto remained firm in its place. About this time also, blotches appeared in the face, neck, and various parts of the body, many of which became painful and extensive ulcers:—a considerable degree of fever, apparently hectic, was excited:—a copious and fœtid discharge flowed from the mouth and throat, and impeded sleep:—and the soreness of the parts which perform deglutition, prevented a sufficiency of nourishment from being swallowed.—Medicines, exhibited in every possible form that science matured by experience could suggest, failed altogether of removing or even mitigating the unhappy sufferer's distresses:—the virulent taint or putrescent tendency established in the system, though occasionally driven back, as often rallied, and ultimately prevailed:—the patient fell a victim to it, in the greatest anguish and misery.—The person from whom the tooth had been taken, had all along continued to enjoy the most

grow up and form adhesions with its surface; but, if it be diseased or dead, the gum shrinks from it, loosens, and ulcerates, and the socket is ultimately destroyed by absorption.

Several circumstances, connected with the manner in which the teeth pierce the gums, are remarkable. The cartilage of the gum is distended by the membranous capsule which encloses the growing tooth:—it progressively becomes thinner: the teeth, proceeding incessantly in their growth, divide first their internal, then their external layer:—the gum reddens, undergoes farther distension, its thinness increases, and in the end is divided in one or more parts of its surface. This thinning and ultimate destruction of the dental capsule and gum's margin, are not however the results of wearing or friction, but of a process analogous to what determines a natural aperture in the skin with which an abscess is covered. The sides of the capsule and gum are penetrated by as many openings, as the advancing tooth has tubercles. What of the surface remains between these, is ultimately removed by the effects of pressure and absorption:—the crown of each tooth passes through the membranes of its capsule, and is loosely attached to the neck:—and, the external layer forms a lining to the sockets, becoming to them what *periosteum* is to ordinary bone.

perfect health;—she was frequently and scrutinously examined, without a single trace of disease being discovered either in her person or constitution.—It is exceedingly difficult to conceive what the source of this melancholy occurrence could have been, but the grand lesson which it so pathetically teaches is,—that the wariest caution ought at all times to be exercised,—and a caution almost amounting to a prohibition,—in remedying a deficiency of teeth by transplantation.

Notwithstanding the vascularity of teeth has hitherto eluded all physiological research, there are many reasons for admitting their possession of a living principle. This notion may be deduced from the general appearances displayed in their formation, adhesion, and diseases, as well as from the circumstance of their enjoying a correspondence or sympathy with the structures by which they are surrounded. Vitality and vascularity are ever co-existent; and, when we observe the operations of a living principle in teeth, it is as philosophical to assign them, from analogy, the organs through which this principle is manifested, as to deny them the possession of blood-vessels and vascular action, because there exists no instance in which they have manifested a power of self-renovation.

NUTRITION,—FOOD.

Experience and philosophy unite in confirming the doctrine,—that the organic structures of man and of all other beings endowed with life, never cease, whether in health or disease, from parting with certain proportions of the material elements whereof they are composed. During the first stages of its existence, moreover, the animal frame continues obtaining progressive augmentations of stature; and, by necessary consequence, requires incessant and commensurate supplies of the organizable essences which are applicable to its growth. From this peculiarity of the vital nature, results an indispensableness of repairing these habitual diminutions, as well as of providing for these ever-returning wants, by the introduction of alimentary substances into the system, for the purpose of being assimilated and adapted to their ultimate ends. These essential requisites are furnished, in a manner as admira-

ble as it is beautiful, by means of the nutritive and its subordinate functions.

Nutrition or alimentation, then, constitutes the natural process by which the organic enlargement and strength of animals are promoted;—and this process is perfect or defective in a degree proportioned to the state of the individual's health and of the food's abounding with salutary qualities. Antecedently to its birth and entrance on an independent mode of existence, the Fœtal being,—it has been stated already,—obtains all the constituent principles of its forming body from the mother's nourishment and through the interposition of her circulating systems:—the new-born Infant, incited by unerring instinct, desires and seeks and sucks the maternal milk as the sweetest and best aliment, destined by the Universal Parent for its earliest sustenance:—and, Children require and prefer and prosper under the use of foods artificially commingled and prepared.—Instruction together with gratification may be derived from an attempt at comprehensively discriminating the preferable methods of nursing young ones, and of rightly adapting the management of their diet to the circumstances of their health and age:—and this suggests advantage in premising a description of the nature and qualities of Milk,—the only proper nutriment and the delight of an infant's primeval days.

Whether it be regarded as an article of nourishment or a medicinal agent, Milk forms an important subject of consideration to every one who takes interest in the health and well-being of his race. Generally and in all animals, it is a white, untransparent, bland fluid, somewhat heavier than water, and impregnated with varying proportions of saccharine matter. Its constituent parts, are,—serosity or whey, curd or the cheesy formation, butter, and sugar

of milk which, in common with all the gummy substances, affords the elemental body named, by some chemists, the saccholactic, and by others the mucic acid.

In the different classes of mammiferous animals, these milky elements exhibit distinct variations. Each kind of milk is distinguished by a particular taste which can be discriminated by experienced observers, and an odour that is speedily dissipated, on the fluid being exposed to the influence of atmospheric air, or submitted to ebullition. That of the cow forms the best subject for analytical investigation; and, on this account, is also the most appropriate standard with which, in regard to their natural constitution, the milk of sheep, goats, the ass, the mare, and human female, has usually been compared. For such reason, a view of its properties may be exhibited in detail.

Whey enters, to the extent of about nine-tenths of the whole, into the composition of milk:—it, also, holds curd and butter in suspension. For obtaining it in the purest state, before its acids are developed, new-drawn milk should be coagulated with the flowers of thistles or artichoke, or with rennet, or soluble tartar, or vinegar. These flowers do not indeed produce this effect so rapidly or with so much certainty as the rennet; but this, on the other hand, almost always in one degree or other affects the taste of the whey:—cream of tartar determines a similar result; and, moreover, adds a new salt to the milk. Vinegar, therefore, if sparingly employed, is a preferable agent.—Whatever of free acid has place in whey, is readily neutralized by the earthy or alkaline bases it contains.

Whether it be intended for a beverage, or medicine, or for chemical investigation, whey may be procured by

putting a table-spoonful of pure, mild-flavoured vinegar into two English pints of boiling milk; and, when coagulated, this is to be passed through a close hair-sieve upon a piece of linen or unsized filtering paper. These filters, however, often slightly change the naturally bland agreeable taste of the whey. For the purpose of clarifying this liquor, the white of one egg diffused by beating it in four or five times its own weight of water, should be added, and the whole filtered a second time.—Whey thus prepared, is perfectly limpid, has a yellowish-green colour, and a mild delicious taste, approaching to that of milk. Like its parent fluid, it is always slightly acidulous, even when separated by rennet: and this quality depends on the presence of the butyric and acetic acids. When exposed to the air, it rapidly undergoes important changes;—its acidity gradually increases;—and it deposits minute curdy flakes.—The acid proceeding from the decomposition of whey reddens purpled paper, and is named the *lactic*:—it acquires the consistence of extract or syrup, when concentrated. Lactic acid, then, appears to be a formation originating in the decomposition of sugar of milk; for, it cannot be detected in whey that has been completely soured.

When heated, whey gives out, at first, a considerable quantity of a pellucid watery fluid, less odorous than what is yielded by pure milk; but which, like it, contains butyric acid and some animal substances. On the heat being augmented, the liquid gets a greenish-yellow colour, and becomes viscid as honey. If allowed to cool in this state, it deposits its saccharine principle in yellowish crystals. By re-dissolving these in water, clarifying the mixture with whites of eggs, and evaporating it to the consistence of syrup, pure sugar of milk in the form

of white crystals, is obtained. This substance is semi-transparent, and has the mild sweetish taste peculiar to the milk of many animals:—by some chemists, its formation has been referred to the vital action by which milk itself is secreted. With respect to its physical properties, it appears to hold a middle rank between sugar and gum:—like these also, notwithstanding its animal origin, it is quite destitute of azote. It melts in twelve parts of cold, or in four of boiling water, but is quite insoluble in spirits of wine, unalterable by the action of external air, and altogether insusceptible of the vinous fermentation.

Human milk yields more of this substance, than that of the ass, cow, goat, or sheep. Creamed milk contains, in a thousand parts, about thirty-five, and the cream itself, about forty-four of the saccharine matter:—but, a multitude of circumstances are prone to determine irregular results from experiments instituted for such purposes. Among these causes may be ranged,—variety of food and of climate,—a state of health or disease,—and, in the human female, the all-powerful influence of the moral affections.—All these remarks tend to show that whey has for its component parts,—an excess of watery fluid, some traces of the butyric and acetic acids, a minute proportion of sugar of milk, and a very small quantity of gelatine;—and, of course, is next to useless as an article of food, however refreshing it may be as an ordinary or medicinal drink.

Curd, or the cheesy substance of milk, though generally constituting about an eighth part of its composition, varies as much as any other of the elements of that valuable fluid. For the purpose of obtaining it as pure as possible and free of butter, it should be extracted from milk, the cream of which has first been carefully re-

moved. So long as it remains in soft masses, it is white and semitransparent:—when formed into grained particles, by the expressure of its whey, it becomes opaque, but still preserves its delicate whiteness. Its taste is mild, fresh, and agreeable. Its particles, however, always retain a certain quantity of whey which it is difficult to separate. When deprived of this, it is still mild to the taste, dry, brittle, and will remain for some time exposed to the air without undergoing any change. If the whey, however, be not entirely expressed, the curd forthwith becomes sour, gets mouldy, softens and exhales a very fœtid odour, and acquires successively the different shades of red, brown, and blue. Finally, the putrescent mass passes into a kind of soap, formed by the combination of ammonia with the oily substance which results from this decomposition. Curd, in such a state, continues to be equally soluble in water, as it was before the latter change supervened.

An essential difference has place in the qualities of curd when it results from the milk's spontaneous separation, and when produced by the action of coagulating substances. From its possessing slight ascendancy, the former kind may be regarded as conducing in some degree to facilitate the processes of digestion.

Curd is made, as every person knows, by a great diversity of modes, into cheese:—that prepared from milk previously deprived of its cream contains very nutritious matter, but is difficult of digestion:—when made of entire milk it forms a still more nourishing substance:—cheese made of pure milk with a portion of other milk added to it, has its nutritive qualities thereby increased, and is made easy of digestion by the oily particles interposed between its parts, rendering their adhesion less firm:—and

that, whose curd has been taken from cream alone, is in all respects preferable to the other kinds. When much of its oily substance is dissipated by toasting, it is made to an equal extent, less easy of digestion.—Curd retaining a portion of its whey may be sparingly exhibited to infants; but their digestive organs are imperfectly adapted to the right assimilation of cheese.

Butter is obtained, by a well-known process, from cream, or from milk in an entire state before its cream has been spontaneously disengaged. When thoroughly kneaded and washed, it has sometimes a white, generally a faint yellow tinge which is often deepened by artificial colourings. It obtains great modifications, in its consistence, taste, flavour, and appearance, from the manner of preparing it in different countries, from the seasons, the breed of cows yielding the milk, and from the substances on which they are fed. Whatever be the varieties, however, which it presents—and these are appreciable by the senses only,—it always exhibits, when fresh, the same chemical characters.

Chemists describe the constituent parts of butter to be,—a fatty substance, a peculiar fluid oil combined with varying proportions of butyric acid, about a sixth part of whey, and a minute trace of colouring matter, whose exact nature has not yet been ascertained. Although this whey be always whitish, it includes a very small proportion only of curd:—its milky appearance seems to depend on a kind of emulsion formed by its combination with the fluid oil of the butter. Butyric acid, which exists in whey even after it has undergone distillation, enters in considerable proportion into the composition of butter. Neither this substance, however, nor the fluid oil it comprises, is particularly acid; but they contain all the ele-

ments of the butyric, which forms as readily in them as the acetic acid does in milk.

Butter forms a very nutritive article of food, and may sometimes be advantageously used by persons, in whom milk itself occasions prejudicial effects. Like almost all the other fatty substances, it has been regarded as having a tendency to determine an excess of the biliary secretion. In many parts of the world, however, the inhabitants subsist chiefly on butter: nevertheless, these people are not peculiarly exposed to suffer from bilious complaints:—many persons in our own country, also, take it habitually and freely, without experiencing any inconvenience from its effects. It is, therefore, probable that butter does not increase the quantity of bile, but rather requires an intermixture of this fluid, for the purpose of promoting its being assimilated by the digestive organs.

This view of the properties of butter receives confirmation from experience:—butter, therefore, is contra-indicated in diseases of the liver, wherein the secretion of bile is defective or altogether suspended; because, for want of bile, the butter becomes absolutely indigestible. Convalescents, in like manner, should abstain from using it; and, also, children predisposed to obstructions of the lymphatic circulation. In them, it tends to produce inactivity and torpidness of the bowels, with which an injurious looseness frequently alternates. Persons, too, who are afflicted with paroxysms of heart-burn, have it aggravated by giving butter a place in their diet. Respectively, however, to all these circumstances, it is essentially necessary that distinction be made between the different states of that substance. When fresh, or recently salted, it furnishes much nutritive matter; and, in general, is very easy of digestion. If melted with a gentle heat and pour-

ed on vegetables, it promotes their digestibility, and renders them more nourishing:—but, if it has become rancid or been slightly burned, as in stewed or fried meats, it is then deprived of nearly all its nutritious qualities, and proves injurious to those individuals in whom the powers of digestion are constitutionally or morbidly feeble.

Butter made from milk of sheep and goats, although much less employed, has nevertheless many properties analogous to that of the cow. Sheep's milk yields it in considerable quantity:—it has a pale yellow colour, is moderately firm, melts easily in the mouth, and leaves on the palate an oily impression. Unless it has been subjected to careful and frequent washings, it soon becomes rancid.—This kind of butter forms a chief ingredient in the Rochefort cheese, which is held in high estimation for its excellence.

Milk of goats yields, in proportion, more butter than that of the sheep:—it is, at all seasons, white as suet and remarkably firm;—yet, notwithstanding this whiteness, it does not include any cheesy particles;—a circumstance which may be ascertained, by reducing a portion of it to a fluid state.

Cow's milk, however agreeable to the taste, has very often a slight degree of acidity, even at the very time it issues from the teat. This circumstance has place, although the animal be quite healthy and fed on salubrious herbage:—it may easily be ascertained by dipping into new-drawn milk, a piece of litmus or *blotting* paper which instantly has its purple more or less brightened into a scarlet colour. What produces this change is, by some, considered as a minute proportion of the acetous, by others, of the oxalic acid.

When cow's milk stands at rest, in a temperature be-

tween 50° and 55° of Fahrenheit's thermometer, it separates sooner or later into three parts,—the cream on its surface,—the cheesy substance which coagulates underneath the preceding,—and the serum or whey whereon floats a kind of clot formed out of the cream and curd. If it be placed in a temperature either too high or too elevated, the formation and spontaneous separation of the cream is thereby proportionately injured. Contact with the external air does not appear to be necessary to the milk's giving out its cream:—this process advances even in vessels accurately closed and full to their corks, and also in vases replete with carbonic acid gas:—and, it may be retarded for several months by bringing the milk every day to a moderate heat.

If milk be left unagitated for some time after its first natural separation into three parts, the cream acquires a darker colour, becomes sour, gets covered with mouldiness, grows bitter, blackens, and putrefies:—the whey, in which the cheesy matter is floating, acquires an acid taste:—last of all, the cheesy matter itself begins putrefying like the cream and gives origin to a new acid, analogous to that which accompanies the spontaneous decomposition of all animal substances. On the other hand, if milk be prevented by frequent agitation from passing into these changes, it undergoes the vinous fermentation* and

* *Koumiss*, the favourite beverage of the Tartars, is a fermented or viscous liquor, prepared from the milk of mares. These wanderers make it in large quantities at a time, and promote its chemical changes by frequent agitation. To the proportion of milk, they add, as a ferment, a sixth part of water and an eighth of the sourest milk of cows they can obtain, or a smaller portion of old koumiss:—the vessel is then covered with a thick cloth, and allowed to stand in a warm place for twenty-four hours, when the

a liquor is thereby produced in about twenty days, having a slight degree of acid, and yielding alcoholic spirit by distillation.—Butter-milk, when recently made from uncreamed milk, is known to comprehend properties almost identical with those of fresh milk from which the cream has been separated:—it is, therefore, applicable to similar uses, and may contribute, with nearly the same advantage, to the general purposes of alimentation.

Milk of goats emits a particular odour, very much resembling that of their perspirable fluids:—it is least offensive in those which are white, those that want horns, and those properly tended. At certain seasons, this odour is remarkably intense. The milk itself contains a greater proportion of curd than the cow's, but is more viscid. Butter separated from its cream, has considerable firmness, and is at all times white:—it is proportionately less abundant than in the milk of cows and sheep.

Ewe's milk yields butter in greater measure than that of the cow or goat; but it is softer and more oily:—its curd, likewise, is tough and greasy. Cheese made of it, is both pleasant and nutritive.

liquor is well beaten with a stick, for the purpose of mixing its thicker and thinner parts which have separated:—it is now placed, for another twenty-four hours, in a high narrow vessel, and the beating repeated till the liquor has become quite homogeneous.—This liquor will keep, for some months, in a close vessel and cold situation; but must be well mixed by beating or shaking, every time it is used. A spirit is sometimes extracted from it by distillation. The Arabs make their *leban*, and the Turks their *youart*, in the same manner. When properly prepared, it may be left to stand till it becomes quite dry; and, in this state, it is preserved in bags, and dissolved in water when required for the necessary purposes.

Clear yellow cream in profusion is rapidly thrown up by the milk of mares. It can, with great difficulty, be made to furnish a small quantity of soft butter, by means of agitation: but the quality of this is not good. It contains very little curd, which is almost inseparable from the cream:—its consistence is little different from that of the human female:—and, it combines more saccharine matter than the milk of sheep or goats.

Several natural resemblances exist between that of the ass and human milk:—its colour, smell, and fluidity are imperceptibly different:—its cream, however, is less abundant. Butter made from it is exceedingly soft, white, and insipid; and it possesses the remarkable property of being soluble in butter-milk, from which it can be separated anew by means of agitation, if the vessel containing it is held immersed in cold water. When left at rest, it parts with its curd in the form of very delicate loose particles, even before it has become sensibly acid. Its taste remains sweetish and agreeable, after being deprived of its cream. This milk differs from the cow's, in containing a larger proportion of sugar of milk, less curd, and less cream which is also more tasteless.

Human milk is whiter than the cow's; and, when tested in its newest state with purple paper, appears to be equally acid. Its composition, however, is so singularly diversified, that in different females it often varies considerably in its taste, or colour, or consistence, or the quantity of its cream. In some individuals whose milk contains an irregular proportion of whey and is destitute of curd, it gives out more or less cream but never any butter, although strongly agitated:—neither does it coagulate, on the addition of an acid. In others, it presents a thick, tenacious cream;—yields, on undergoing

moderate agitation, a yellow, firm, uniform butter;—is coagulable by acids;—and parts with a white compact curd.

By careful comparison of the chief discrepancies presented by these six different kinds of milk, it appears,—that, notwithstanding the diversity of their analytical results,—the principal elements of milk in each of these animals, generally considered in relation to the others, do exhibit very constant proportions. Respectively, then, to this view of their nature, they may be distributed into two classes:—one including the milk of *ruminating*, the other that of *herbivorous* animals. In the first, stand the goat, the sheep, and the cow, in whose milk the curd and butter predominate, while the whey and sugar of milk are in defective proportions. The ass, the mare, and the human female who is often doomed to subsist on vegetable food, go into the second:—their sugar of milk and whey exceed, in their relative quantities, the butyraceous and cheesy substances, which are fluid and nearly incoagulable.—In the annexed table are exhibited the comparative proportions of curd, butter, sugar of milk, and whey, contained in the milk of each of them, according to their arrangement in the preceding classification.

TABLE.

Comparatively. } CURD.		BUTTER.	SUGAR OF MILK.		WHEY.	PROPORTIONS.
Milk of the	Goat.	Sheep.	{	Woman.	Ass.	Yields most.
	Sheep.	Cow.		Ass.	Woman.	... less.
	Cow.	Goat.		Mare.	Mare.	... least.
—		—	—	—	—	—
Milk of the	Ass.	Woman.	{	Cow.	Cow.	Yields most.
	Woman.	Ass.		Goat.	Goat.	... less.
	Mare.	Mare.		Sheep.	Sheep.	... least.

Milk is more susceptible of sudden and frequent variation in the proportions of its constituent principles, than any other of the animal* fluids. If a quantity of that yielded by the cow be divided into three equal parts, each of which has been *successively* taken at the same milking, and set to rest during the necessary time, what was first drawn will give out much whey and very little butter, the second have less whey and more butter than the former, and the third be richer than either in curd and butter; and, of course, be more foodful and nutritious. Now, these results are almost universal and may be reproduced, without inconvenience, by a very simple experiment. At the same time, they establish an interesting fact in natural history;—they hold equally true and general, relatively to the nature of human milk;—and, consequently, suggest considerations possessing extreme importance with respect to the *manner* of suckling infants. By this fact, then, it is made obvious,—that, when a mother falls into the habit of putting her child *very often* to the breast and allows it to suck only for a *short time*, she gives it merely the portion of her milk which is thin, abounds with whey, and affords very little nourishment. Mothers

* Milk of the bitch has been administered as a medicine, to persons suffering from disease; and, in these, it almost uniformly produced the mildest aperient effects. Its taste is not unpleasant, and the influences of imagination in exciting disgust at its use, may be obviated to a reasonable extent by feeding the animal with a pure human diet. An epileptic lad took it to the amount of two ounces, every morning and evening, with manifest advantage. It operates with considerable benefit, when given in suitable proportions to nervous children, both before and after their being weaned.

may also learn from the same instructive fact,—if they will believe it,—how essentially necessary it is to the health of their tender offspring, that they be placed to the breast at regular and lengthened intervals;—be permitted to remain sucking for a long time;—and, by this means, be enabled to imbibe the part,—the last and best,—of the maternal milk which contains most of the creamy substance and, on this account, is more salutary and nutritional.

Immediately before giving birth to their offspring and for some days after the beginning of their suckling state, all the lactiferous animals have their milk endowed with qualities altogether different from those it subsequently possesses. That yielded by the cow is familiarly designated, in this country, by the terms *biest*, *biestings*, and *biesty milk*, the peculiarities of which are worthy being placed under consideration.

Such milk, when drawn a few hours before the cow calves, is a yellowish, semipellucid, viscous fluid, wherein slender bodies like fibrils are held in suspension. Its taste is peculiar, rather insipid:—it has the consistence of thin syrup. When deposited in an open vessel, it evolves a thick, bland, unctuous, yellow cream, which yields rich, firm, gold-coloured butter. It will give out cream twice in the twenty-four hours, without having its characteristic properties perceptibly dissipated; but the butter made from the second has a paler colour. When subjected to the actions of heat, the acids, or spirit of wine, it coagulates into an albuminous mass resembling the white of eggs. Pressure curdles the whole of this milk, without inducing any disengagement of whey.

Biesty milk of the cow, on the day of her calving, frequently contains some streaks of blood which imparts to

the fluid, when shaken, a reddish tinge. Its consistence is then thin and very sizzly, and its taste nearly similar to that of ordinary milk. When left to stand in an open vessel, it sends up a thick viscid cream which furnishes fine orange-coloured, spongy butter; richer indeed, but less pleasant, than what common milk produces. What of it remains, after being deprived of the cream, acquires the appearance of soapy water. It coagulates in twenty-four hours and in the temperature of 66° of Fahrenheit's thermometer; but the vessel containing it requires being immersed in boiling water, before its whey can be disengaged from the cheesy substance. Its curd forms a glutinous mass, which affords analytical results not materially different from those of milk:—when compressed and properly dried, it becomes hard and diaphanous as horn:—its whey is semitransparent and acescent; and, on being evaporated, furnishes alkaline crystals and a proportion of saccharine matter. Throughout the next three or four days, it remains coagulable by means of ebullition; but this property, in a short time, ceases:—the thickness of its cream, also, gradually diminishes, and its butter becomes paler:—and, by degrees, it comes to differ from milk in its maturity, only in the excess of its whey and the smaller quantity of butter derivable from its cream.

From these results, it appears to be conclusive,—that cow's milk during the first days after her having calved, includes much in its nature, essentially dissimilar from what is secreted by the same animal at a later period:—that such milk is remarkably distinguished by its viscous and albuminous characters;—and, that it affords a very large proportion of butter. These peculiarities commence disappearing in a few days; but, it is generally

more than two months, before milk undergoes the last transition of which it is susceptible.

The same law of their vital constitution which determines these changes in other animals, operates also on the fluid elaborated for similar purposes, in the breasts of the human female. This, at the time of her infant's birth, is thin, mild, and sweetish:—it is adapted, the best of all things, to allay the excessive sensibility of the young one, and to expel the meconic deposition, in due time, from its bowels. For this purpose, it is requisite that the child be put very early to the breast; because, so soon as the “milk-fever” begins, the milk itself commences passing through its natural alterations.

Great differences are observable in the quantity of its milk, when a suckling female is fasting,—especially if the fast has been long,—and when she has recently taken food. From this fact results the conclusion, that the elements of the milky fluid are very sensibly affected by variety in the quantity and quality of the food itself, and also in the intervals between exhibiting it. Cows accustomed to graze in moist meadows covered with rushes and sedges, yield milk in great profusion; but it is thin and insipid:—the butter taken from it, moreover, has a suety appearance and is very soft. If, however, the animals be sent to depasture dry champaign fields or open woodlands, their milk soon becomes more sapid, and its butter firmer, although the atmospheric temperature in which they feed be the same, under both circumstances.

Females of the bestial tribes, which subsist on food composed of animal and vegetable substances whose proportions are perpetually varying, have their milk, on that account, more susceptible of being modified by the nature of such aliment. Let a suckling bitch be made to

live, for eight days, on vegetable nourishment alone, and its milk will readily undergo spontaneous separation;—be coagulable by the ordinary means,—yield a larger proportion of cream and curd than that of the goat,—and, indeed, appear to have acquired all the properties of what is secreted by the ruminating animals. Let, on the other hand, the same bitch be fed solely with raw flesh, and the quantity of her milk shall be observably diminished,—shall resist spontaneous coagulation,—and, instead of the acidulous, present true alkaliescent properties. If such modifications are determinable in the milk of inferior animals by the sole agency of food, what then must be the extent of its influence on that of the human female whose diet is so variable and so complicated, and who herself is exposed, at all times, to the operation of innumerable other causes possessing tendency to occasion equally injurious effects?—Reflection on this indisputable fact suggests an explanation of the different results which have occurred to chemists in their researches into the nature of human milk:—and, it additionally suggests the necessity of suckling mothers attentively combining in their own diet such alimentary substances as are known to enrich the milky sustenance of their babes.

Mental affections,—grief, gladness; anger, fear; and indeed all the passions,—deteriorate the qualities of human milk, in a very direct and remarkable manner. Sometimes, on experiencing strong or sudden emotions, females giving suck have their breasts in a short time become shrunk and flabby, and the secretion of their milk altogether suspended. Ebriety and anger not only determine the last-mentioned result, but alter the natural properties of the milk itself, make it prejudicial to the nursling's health, and thereby excite sharp pains in the

bowels, or not unfrequently the most distressing nervous agitations. An infant was abruptly seized with alarming convulsions when sucking its nurse, who had just been ill-used and even whipped by her employers, for a very venial fault. Equanimity and happiness, therefore, are as indispensably requisite to the suckler of a babe, as the influences of wholesome food and salubrious air;—and, parents should never cease to appreciate the importance of guarding themselves and nurses from being exposed to sustain the impressions of melancholy, affective, and painful sensations.

Disease, in all its forms, acts with very ungenial influence on the secretion of human milk. In acute maladies, it is either considerably diminished or altogether suspended; but the exact modifications determined, by this means, in its constitutional elements, have not been analytically ascertained. Nurses who are subject to nervous seizures have their milk become transparent and ropy as the white of an egg, at every time an accession of their complaint supervenes; but, in a few hours after the height of such paroxysms, it gradually regains its ordinary characters. Milk of a cow, whose lungs were nearly destroyed by tuberculous consumption, was found to contain a remarkable proportion of the phosphate of lime. If this fact be constant in all the mammiferous animals affected with tubercles in the organs of respiration,—and if it shall be known to exist in phthysical women giving suck to infants,—it is an important fact, and one that ought to engage the serious attention of physicians and physiologists.

Indolence moreover, and luxury, and all undue indulgences, have inevitable tendency to vitiate the best properties of milk. Demonstration of this truth presents itself

to the mind of the most heedless observer, in the languid and enervated condition of such infants as are nursed by mothers who possess not fortitude, nor prudence, nor good principles, to enable them to renounce the pleasures of gay society during the time, at least, that nature requires them to discharge the sacred duty of suckling their own offspring. The false refinements of civilization, by removing such persons far from the state natural to mothers, deprive them, to an equal extent, of the power of discharging this important function.

Infants should be put to the breast in four or five hours after their birth:—in the interval, they may get some sweetened water or other very mild thin fluid, for the purpose of removing whatever viscid matter may be adhering to the internal surfaces of the gullet. If twenty-four or more hours shall elapse before the babe is permitted to suck the mother, her breasts become distended with her milk, the act of sucking occasions her acute pain, and the exertions of the infant to imbibe its new beverage often prove the cause of painful chaps in the nipple. Simple as this circumstance of being early sucked, may appear to be, it contributes essentially to making the milk-fever milder, and sometimes altogether prevents its occurrence. Such delay, too, excludes the young one from obtaining the full advantages which nature has bountifully provided for it, in the use of this first milk. Even the parent's own health and the activity of her lactiferous functions depend, in no small measure, on her breasts being excited by an early act of sucking. This has the beneficial effect, also, of conducing not remotely to the milk's increase and the improvement of its quality,—both which indeed, especially its quantity, are generally commensurate with the degree of vitality possessed by its se-

creting organs:—besides, during the time it remains in the breasts, it undergoes an elaboration by which its nutritive virtues are augmented and matured.

Babes, at their birth, do not immediately require nourishment:—the stomach is then filled with a gelatinous formation,—the remains of what had been secreted by that organ, for the new one's sustenance during its foetal growth. Generally, a short time,—three, or five, or seven hours, or more,—elapses before it begins manifesting appetite or a desire of sucking; and, in the interval, its bowels and bladder, excited to action by dilatation of the chest in respiration with a concomitant pressure of the midriff on the parts within the belly, sometimes get to be partially relieved. Sweetened wine, manna in solution, syrup of roses, and various other compositions, alike unprofitable or pernicious, are frequently then given to it, with the intention of invigorating the babe, and of hastening its first dejections:—but, they are all altogether useless and unrequired. For the satisfaction of impatient mothers, however, it may receive some sugared tepid water, which will assist in diluting the dark green, roppy matter that still lines the alimentary passages:—but nature, ever wise and provident, has prepared in the maternal breasts a fluid infinitely the best adapted to the execution of this necessary purpose,—and this is the first milk, a fluid at once sweet and agreeable, aperient and remarkably nutritious. Even though a mother do not intend suckling her own child, she should at least never refuse it her first milk, for which there is no equal substitute:—it is the only means of securing, as much as possible, the tender being from gripes and colic pains, by expelling the meconic matter from its bowels more perfectly than any artificial preparation whatever. An in-

fant's stomach is altogether too delicate to bear the wine or purgative drugs wherewith it is too often the custom to torment it, at the very dawn of its new state. Let such, especially a "be-drugged or vinified" babe, be put to suck a nurse whose breasts are replete with old milk, and it will soon be observed to writhe with internal suffering, or to vomit the liquid so foreign to its age and constitution.

With the force of all these observations, it is intended to impress strongly on the minds of parents, the importance of the following practical conclusions:—that, the maternal milk is the natural food of infants:—that, mothers, except for the most urgent reasons, ought never to renounce the delightful duty of suckling their own offspring:—that, the first milk constitutes the best nourishment and the best medicine for a new-born child:—that, next to the mother's in suitableness for the object, is the milk of a healthy nurse whose own child's birth was, as nearly as possible, coëval with that of her nursling:—that, after these, stands what is furnished by the cow or other animal in whom it retains properties approaching to those of human milk:—and that, as milk is favourable to the perfect development of the teeth and bones, and indeed of the whole animal economy, it ought to enter, in proportions appropriately varied, into the diet of all infants, children, and growing persons.

Preparatively to putting her young one to suck for the first time,—which may be in three or four hours after its birth,—the mother should have her breasts carefully formed,—primarily with tepid water and soap of the blandest kind,—and then with a lotion composed of milk and water in equal proportions, slightly sweetened, and warmer by a few degrees than the temperature of her

own person. Such means, notwithstanding their simplicity, contribute much to accelerate the secretion of milk, make its progress less distressing and, by removing the bitter exudation naturally deposited on the nipple, facilitate the suckling's first exertions at obtaining the vital fluid destined for the nourishment of its helpless days. While this is being done, she should retain a lying posture in the bed, and be exposed to the least possible annoyance, or fatigue, or danger of cold. Without changing her attitude, the babe may now be admitted to her breast and will, in general, begin attempting to suck. If, however, it be listless and reject the nipple,* it ought to be withdrawn, so as not to disquiet or exhaust the parent with its refusals or unavailing efforts:—but, in a short time, a new trial of its inclinations may be made. When mothers cannot give the breast, except in a sitting posture, they should be raised with the gentlest caution, have themselves comfortably supported with pillows, and secured by proper coverings from sustaining injury by the influences of external air.

Infants, at the beginning, are able to obtain but little milk:—this little, however, is of the highest use for promoting objects in them, which have already been ex-

* Defect in the size or formation of the nipple, is described as having sometimes been observed; and various mechanical contrivances, or its being sucked by an adult or an older infant or even by a lamb, have been recommended as appropriate remedies:—but, this is a defect which must be regarded as being almost universally rather imaginary than real; and, when unnecessary attempts at supplying it are instituted, they are calculated to injure the delicate organ on which such practices may be employed, as well as to defraud the babe of a precious boon which the proudest ingenuity of science is unable to replace.

plained. In each successive endeavour, from its exciting the nerves and vessels of the breast, the supply becomes more copious, and they imbibe it in greater abundance and with the greatest ease:—in the end, it constitutes a most delicious fare on which they feast with advantage and delight.

Notwithstanding its being the natural and positive duty of all mothers, under ordinary circumstances, to suckle their infants, yet such reasons may exist or be induced, with regard to some individuals, as shall render their engaging in the discharge of this duty either impracticable or improper. Such mothers, however desirous, cannot therefore undertake the charge of suckling, who have the organization of their breasts naturally imperfect, or injured by the effects of accident or disease;—because, both these states give rise,—to defect in the milk's quantity or quality, sometimes to its total absence,—to undue contraction of the mammary vessels, with consequent difficulty to the child, of sucking them,—or, to faulty relaxation, inducing both a want of power in them to retain the secreted milk, and a constant involuntary extillation of it from the nipples. Others, after having attempted it, will require to discontinue nursing when they find it proving injurious to their own health, by occasioning pains in the back, loins, and chest,—cough, panting, and uneasy breathing,—head-ache, failing of the sight, with inflammatory and other affections of the eyes,—insuperable watchfulness during the night,—and loss of appetite, thirst, slowness of the bowels or their excessive freedom, and similar symptoms of impaired digestion.

Very few females have constitutions naturally so weak and feeble as to incapacitate them for enjoying the delights of suckling their babes. Has not such a mother

already been able, without injury to her health, to furnish from her own system the incessant supplies required for the nourishment and growth of the new one throughout all its foetal age? Many, the most delicate and despondent, are daily seen to remain quite vigorous and happy so long as they continue employed in the performance of this interesting office. Observation of such a fact, then, would suggest the propriety of every one engaging, at least, in a trial of her powers:—but, this may be discontinued so soon as she finds herself unequal to the task of furnishing enough of healthy milk, or of undergoing the cares and fatigue inseparable from her charge.

Mothers who resolve on rearing their progeny with the maternal milk, ought to form an unyielding resolution of denying themselves the enjoyment,—if there be such a thing in nature,—of every pleasure and amusement which may lead to personal or mental exhaustion. Irregularity of all kinds,—excessive indulgencies, by whatever name they may be called,—intemperance under every shape and in every degree,—all indeed, in social or domestic life, that conduces whether immediately or remotely to depress the mind or exalt the passions, is absolutely incompatible with the tranquillity of that equal and sedentary life which the duty of suckling infants demands. If there be such mothers, then, who are unable to seclude themselves from such engagements or resist the incentives to such practices, it is in all respects proper that the pious labours, for which they thus ungenerously disqualify themselves, should be transferred to the management of a faithful nurse.

Various and discordant sentiments have been entertained on the question,—whether females having the consumptive taint ought to become nurses. How, it has

been asked, can an infant possibly sustain injury from sucking milk secreted from the blood of a being, by whose blood alone and without the intervention of other agency, the elements of its fœtal existence were furnished and, in the end, favourably perfected? Experience, however, resolves the difficulty by presenting instructive facts to the consideration of mankind. It is well-known that, though many of the worst symptoms in a phthisical woman do subside during her pregnancy, they all re-appear, and often in an aggravated form, immediately after that condition has terminated. Her lungs fast decay, her strength sinks, her person becomes emaciated, she gradually ceases to desire or properly digest food, and her infant, however healthy in appearance, forthwith begins to exhibit signs of suffering from griping pains, or from accessions of nervous agitation, which have been known to become permanent. For the purpose of preventing the affections so often consecutive to child-birth, such mothers may lose their milk for one fortnight or a month,—and, it has been advised that a young one of the sheep or dog should be employed in this office:—but, for her infant's sake as well as her own, no woman having a decided tendency to consumption ought to undertake the charge of suckling a child. The vitality of blood is matured in the lungs, and the milk's perfection depends much on the purity of the blood; consequently, the milk of a consumptive nurse cannot be nutritious,—because her blood is insalutary in proportion as the organization of her lungs has suffered from the depredations of disease.

Necessity or selfishness, then, must be regarded as the chief motive to a mother's withholding from her infant the enjoyment of its natural sustenance. When, therefore, either of these states is found to admit of no other reme-

dy, the offices of a proper nurse ought to supply those of the less fortunate parent:—and, in the selection of such a substitute, an attentive exercise of the judgment and of experience is requisite.—That person, who aspires to hold the situation of a nurse, should be distinguished by qualifications which peculiarly fit her for the faithful execution of the charge she expresses desire of undertaking. She ought to be young and modest and healthy,—neat in her dress,—cleanly in her person,—active in her habits,—temperate in all her desires;—have a candid disposition, a cheerful temper, and an instructed mind. Her teeth should be white and clean,—her gums sound and florid,—the odour of her breath agreeable,—that of her insensible perspiration inoffensive,—her nipples rosy and small, but readily swelling from excitement,—her breasts smooth and prominent, rather oblong than large. Her milk ought not to be more than four months old, because it then becomes less digestible by the stomach of a newborn babe:—it should flow with readiness,—be thin and bland and abundant,—and have a bluish tinge, with a sweetish taste. It is necessary that she be perfectly free of every hereditary or constitutional taint or manifest disease, and altogether blameless of every practice requiring concealment;—that her character be eminent for patience, equanimity, kindness, and obligingness;—and that she show herself to be fond of children, dexterous in managing them, watchful during their sleep, and capable of undergoing fatigue and want of rest without injury to her own health.

Women having a brown complexion generally yield milk in profusion:—theirs, also, is rich and nourishing:—that of fair persons contains less of the pure alimentary principle, and has been considered as having a tendency

to create heart-burn in some infants, and in others a weakening frequency of their dejections.

Moderate and regular exercise, in the open air, imparts energy to the vital powers of females giving suck; and, from this, their milk derives a better quality, has the proportions of its component elements more equalized, and is made less susceptible of going into sudden coagulation within the stomachs of their charge. They themselves should subsist on a light generous diet composed of a due mixture of animal and vegetable substances,* accompanied with the free use of refreshing drinks:—but, in all this, particular regard should be had to the individual's natural temperament and previous habits of life.

Beyond the mother's milk, an infant requires no other sustenance till after the first teeth have begun to appear:—the development of these is generally co-incident with that of the stomach's powers, and thereby seems to indicate the want of more solid nourishment. Previously to this change, which usually happens between the fourth and sixth month from birth, artificial foods almost always disagree with the digestive organs, and excite internal pains, sometimes disease. In the meantime, it should be admitted to suck only at stated intervals of about four hours: and, on each occasion, be allowed to drain the

* Dr. Struve, in his Tract on the Education and Treatment of Children, gives the following prescription:—"Let two parts of milk rise over a low fire, and add one part of well-fermented beer, previously boiled:"—sugar may be added to this if desirable. This beverage is to be taken cold:—it has been attended, he says, with the greatest advantage by women who were already so exhausted, that they thought it impossible to continue suckling their children:—they became replenished in a short time, and recovered their strength with a continued increase of milk.

breast. Frequent sucking, especially during the night, is unfavourable both to the babe's prosperity and the health of its mother, who never ought to permit its lying asleep with the nipple in its mouth.

Infants, as their dentition advances, may have the quantity of prepared aliment, superadded to the natural, gradually augmented. Such forms of it are preferable as consist of milky and farinaceous substances, agreeably sweetened:—of all these, recent cream of cow's milk diluted with whey, and arrow-root appear, from experience, to be the most congenial.

Preparatively to its final discontinuation, the nurse's milk requires being exhibited in lessening proportions as well as at more distant returns. Vigorous and healthy children may be weaned, as convenient, in their eighth or tenth month; but such as are puny, delicate, or diseased, should have this change deferred to a later period, determinable entirely by the strength of their assimilative and constitutional powers. According to the peculiarities of their nature, all children are more or less affected by the transition to their new diet;—it, therefore, becomes the duty of their mothers most solicitously to watch its general effects on their sleep, appetite, and dejections, for the purpose of having the slightest disturbance of the system counteracted in its rise.

Milk of the cow ought invariably to constitute a chief ingredient in the food of children, for many months after the suckling state has terminated. Light dishes, prepared in the usual manner, of flour, oat-meal, biscuit or powdered bread, rice, arrow-root, tapioca, manna-croup, sago-milk, salep, soft-boiled eggs, animal jellies, isinglass boiled in milk, beef-tea, soups made from chicken or veal, and fishes of the least oily kind, may at the same time

be given to them, in varying quantity and richness, according to their rising age. Wine, even the mildest, excites the whole organic nature of infants, by farther accelerating the rapidity of its vital movements;—nevertheless, some of it, diluted and sweetened, may be occasionally administered to pale, languid individuals possessing a sluggish constitution:—such are often predisposed to have intestinal worms, to the growth of which the wine may prove unfavourable. Coffee, tea, chocolate, and fruit,* are not necessarily unsuitable to the circumstances of infants and children, more than to those of persons in riper years:—each of them is naturally refreshing and exhilarating, and their effects first on the assimilating, and ultimately on the nervous organs, must alone determine the propriety of their use being continued.—After passing the second year of life, the infant begins making rapid approaches, in the developments of his organization and his mind, to what shall afterwards distinguish their character in youth and manhood;—the manner, therefore, and the kind, and the proportions of his nourishment, should be modified, by concomitant advances so as to suit the changes of his ever-varying conditions.

Nature, in fine, has provided, that such sustenance and such cares should be requisite to the proper management of man's earliest infancy;—that parent then who best fulfils an intention so wise and so beneficent, at the same time discharges best an important and praise-worthy duty to nature, to herself, and to her beloved offspring. It is

* Ripe fruit conduces, in no manner of way, to the production of intestinal worms; and, it is a pure error to confound the larvæ of insects seen in *worm-eaten* fruit with the animals that infest the human bowels:—the former never, cannot indeed, give birth to the latter; no two things in nature are more distinct.

not enough, however, that children be taught,—solely by the dread of derangement in their health,—to place restraint on the movements of young desire:—it ought to be strongly and permanently impressed upon their judgment, that the preferring certain kinds of food to others, merely for the love of them, is a degrading and sensual appetite, which temperate men have always hated and the virtuous despised.

DRESS,—APPAREL.

Raiment, dress, or clothing, comprehends all the diversities of fabricated matter employed by mankind, among other indispensable purposes, for that of protecting their bodies from the immediate impressions and vicissitudes of the atmosphere. These important ends are accomplished, in a twofold manner,—by the clothes retaining a certain portion of caloric* on the surface of the wearer's person,—and by their acting the part of an isolating substance so as to repel an inordinate degree of heat.—What

* Caloric is the scientific name of that subtle essence which excites in living structure the sensations of heat:—these, in proportion to the degree of penetrant force exerted in eliciting them, may be gentle or lively or intense. It acts most generally, but not exclusively, through the instrumentality of the sun's rays; and, under particular modifications, pervades the greater portion of space, always increasing the dimensions of those bodies into which its particles enter. Its various evolutions are determined by the reactions of organic or animate, and inorganic or inanimate substances:—that produced by organic re-action, from its constituting a principal manifestation of life, may be denominated *vital*, that originating in the inorganic is *material* heat, because it results from the diversified appositions and combinations of matter undergoing natural or accidental impulsion.

has been introduced into this Section on the subject of dress, relates *generally* to its nature and influences, and *particularly* to the modifications recommended by experience, in its adaptation to the age and peculiarities of children.

With regard to the general consideration of dress, it may be sufficient to enumerate,—the substances of which clothes are usually formed,—their physical properties,—their shapes,—and their effects on the human frame,—relatively to age, sex, habit, and the other circumstances of life.

Animal and vegetable substances exclusively furnish the materials of those fabrics whereof the various articles of dress are made. In primeval time and during the ruder stages of society, men have ever had recourse for their coverings, to the skins of quadrupeds or of birds, and to the bark or spreading leaves of trees and plants. Human ingenuity, however, soon proceeded to invent and mature the processes of spinning, weaving, felting, and of forming in multifarious ways, these different substances so as to render them, in the shape of convenient and elegant apparel, quite applicable to all parts of the body. In this manner, have come to be manufactured,—from cotton, hemp, flax, silk, and the fleeces of various animals,—textures the most diversified and fur-work the most useful, all those parts of dress indeed, which the wants of civilized people and the caprices of fashion require. Vegetable textures are fabricated with the yarn of hemp, flax, or cotton:—animal substances enter into the composition of down, gogram, silks, all kinds of cloth, and the felts which are used in the fabrication of hats. These substances and their productions vary much in their thickness, fineness, compactness, in the smoothness or rough-

ness of their surfaces, and in other qualities, all which singularly influence the physical properties of the garments into which they may be converted.

Two qualities in the materials of which dress is composed, are not unworthy being illustrated,—that of conducting caloric which secures the body from the inclemency and vicissitudes of the atmosphere,—and that of admitting being impregnated with external or internal moisture, or of allowing it readily to escape. Those which are the worst conductors of caloric form the warmest clothes, and this circumstance depends on the manner in which the stuff, whereof they are made, has been manufactured. When the warp of cloth is very loose and porous, or if it includes much air in its interstices, such cloth must necessarily be an imperfect conductor of caloric, because the air confined in the meshes of its texture possesses that property very feebly itself; whereas cloth of a close texture, from its holding little or no air, permits the caloric to escape easily and, by consequence, is less warm than that of a looser fabric. This fact accounts for cloth that is smooth, dense, and fine, being less warm than what is rough, velvety, and loose in texture. The same fact also explains the reason why substances the least capable of conducting caloric are those which afford the best protection from external heat:—and, in like manner, it explains how what is the worst conductor of caloric becomes the most suitable clothing when the atmospheric temperature is higher than that of the human body.

Fabrics made of animal, and those made of vegetable materials, do not possess, in an equal degree, the property which enables them to absorb or exhale, with greater or less facility, the external moisture and the globules of

human perspiration. All kinds of linen are readily penetrated by fluid essences, and they as readily part with them; that is, they are easily wetted and as easily dried again:—textures made of animal materials, on the contrary, imbibe them slowly and retain them for a much longer period: the latter, consequently, present greater advantages, because from them the evaporation of moisture is slow and insensible. It is, therefore, quite manifest that a woollen dress next the body has more salutary effects than one of linen which, by admitting a sudden escape of the perspiration it had imbibed, may give rise to a dangerous evaporation and cooling. Garments and under-dresses of wool are particularly necessary to those individuals, who perspire abundantly and are exposed to frequent atmospheric changes:—they enable such persons to escape returns of rheumatismal pain, diminish the intensity of certain catarrhal affections, and prevent or mitigate a multitude of disorders that result from derangement of the cutaneous perspiration.—By these remarks, let parents be instructed how very mischievous is the practice, either by children or other persons, of drying their moistened clothes over the parts which have been perspiring:—it produces a rapid and pernicious evaporation, whether done by exposing them to the heat of common fire or to the rays of a beaming sun.

Those garments, moreover, that naturally preserve humidity the longest, are alike disposed to retain, in their textures, the noxious qualities of the atmospherical and perspirable fluids. Woollen and all kinds of clothes fabricated of animal substances readily receive, and keep most tenaciously the infectious particles exhaled from the pores of human bodies, or communicated through the surrounding atmosphere;—and, these self-same particles

are capable, even after a very long interval, of reproducing the disease by which they themselves were originally generated.

Thickness of the clothing renders it warmer, when its textures are otherwise suitable; but as weight is next to being inseparable from density, heavy raiment oppresses the body, embarrasses its motions, and fetters the free exercise of the locomotive functions. That fabric of cloth, therefore, is preferable, wherein the qualities of thickness and lightness are combined.

Colour of the dress,* apart from the manner of its texture, is not a thing of so little importance as it may at first sight appear. White, colourless clothes reflect heat and never absorb it; consequently, in this respect, they contribute less to the maintenance of heat than such as are black:—bright tints hold the same relation to the dark and deep. By knowledge of these principles, the inhabitants of hot countries are led generally to wear uncoloured garments:—our compatriots who go to settle in the West Indies and the East, may find comfort as well as security in adopting the practice. White hats and white

* Tourtelle, a continental writer, regards the colouring matter of cloth as having a susceptibility of being absorbed into the system through the pores of the skin and, in this way, of giving origin to very dangerous diseases. In support of this remarkable opinion, he relates the cases of two soldiers who had the surfaces of their bodies impregnated with a deep blue colour which, he is satisfied, must have been abstracted from their clothes — Two isolated facts, however,—admitting them to be facts,—cannot sanction the establishment of a theory having such important tendencies:—discolourations of the skin are known to originate in various causes, to some of which the subjects of Tourtelle's histories may have been exposed.

veils, by the same law, are more useful and agreeable than the black, during the heats of summer.

Colourless clothes, however, resist heat only by repelling the sun's rays:—their possession of this property, therefore, qualifies them in some respects for being used in dress, during the winter:—by not reflecting it, they confine the body's native heat, obstruct its transmission, and thereby prevent its diffusion through the ambient air:—in other words, they prevent the particles of *material* caloric from entering, and the particles of *animal* caloric from escaping, through the interspaces of their texture. On the other hand, if the wearer be not exposed to the rays of the sun, and so long as the atmospheric temperature is a few degrees lower than that of his own person, black clothes which transmit, as readily as they absorb, *material* heat, may be used without discomfort even in hot weather:—in such circumstances, the dress allows a portion of the *animal* heat to escape, and thereby maintains a refreshing coolness.

Considerable attention is necessary in adapting the forms and proportions of dress to the changes of season:—those who employ such precautions do much to obviate the risk of inducing a diminution or an entire suppression of the perspiration, as well as the disorders of health which either of these states is calculated to determine. With the object of preventing such consequences, children ought to be at all times lightly clothed:—this practice conduces to familiarize them to every variation of temperature* and, with the aid of cold bathing and exer-

* Habit blunts, almost annihilates the effects of atmospherical vicissitude;—it deadens the influences of the most intense cold as well as those of the most intense heat. Thus, may be seen peo-

cise, purifies and invigorates the constitution. Babes and infants and children were so treated by the primitive Romans, who will ever be admired and imitated as the most robust, the most indefatigable, and the most valiant people in the universe.

The principal and direct use of dress is to secure the body from the excesses of atmospheric heat, cold, and moisture:—it establishes a barrier between the wearer's body and the surrounding temperature, which is capable of deeply influencing the animal economy, by its excess and its changes. Another chief office of clothing is, the absorption of the cutaneous perspiration:—this absorption, as well as the evaporation which results from it, is influenced in its rapidity or slowness, by the nature and texture of the person's raiment.

Mankind have ever been prone to encourage the invention of variety in the shapes of their dress:—this is the circumstance, which has led to its being more frequently modified by the caprices of frivolous or fashionable taste, than by its adaptation to the useful purposes it should naturally fulfil.—Wide apparel has, in all ages, been most extensively in use, especially by the inhabitants of hot and temperate regions. From its having so much of easy wideness as to leave free the motions of the trunk and members, it conduces much to the wearer's health, comfort, and convenience. Narrow clothes, on the other hand,

ple accustoming themselves to use the thinnest raiment in very cold regions, while others are buried, as it were, under an enormous mass of clothing beneath the burning climate of the East;—and, in neither, does the practice prove injurious to health.—Habit is very strong; that formed in youth is the strongest:—let, therefore, the propensities of this age be properly directed, and its habits have their foundations in virtue and truth.

when applied easily and uniformly over all the person and the limbs, increase the energy and power of the muscles without tending, in the least degree, to impair the health. Such parts of the dress, however, as exercise circular constriction or local pressure, varying in extent, confine and embarrass the organs of motion, retard or intercept the circulating fluids and, in this way, act an effective part in producing accidents of the most serious nature:—by such causes, paroxysms of giddiness, swoonings, and even apoplectic* seizures, are either fostered or hurried to their height, in persons predisposed to such affections, by their organic constitution or their habits of life.

Raiment, in all or any of its parts, may be so constructed or so used as to acquire a powerful tendency towards disordering or even inflicting permanent injury on a part or organ whose natural actions are requisite to the comfort of a person and the uniformity of his well-being. The different effects, therefore, which may be occasioned by particular articles of apparel, and the particular modes of applying them by either sex, should not be regarded with indifference. The neck, the chest, the waist, and even the head, all contain essential organs, the regular discharge of whose functions is absolutely indispensable to health:—the perfect freedom of these functions cannot be inconsistent with beauty or elegance of form:—they ought, therefore, to be left at all times as free as nature makes them,—they ought never to be em-

* Professor Portal, in his Treatise on Apoplexy, relates the case of “un Grand Personnage” who sustained an attack of this disease occasioned by the use of corsets and drawers tightly laced, for the purpose of diminishing the “*volume* of his belly and of his limbs!”

barrassed by the artificial and fantastic refinements of dress.

Young ones, for many of the first days of their infantine state, require a course of management and many precautions adapted to prepare them for sustaining the influences of their new circumstances as these successively arise:—among others, those which relate to the applications of their dress, are not the least important.—Forthwith, on the final dissolution of its organic connection with the mother, an infant ought to have itself put into clothing, with the greatest care and in the tenderest possible manner. After it has been well washed with warm water and soap,—and while this is being done, the head should be attentively supported so as to prevent the babe's receiving injury from want of power in the cervical muscles to balance its weight,—its navel-string must be enveloped in a piece of the softest cloth, and a band, passing lightly around the waist, be carried over this and tied, not *pinned*. The other parts of its clothing,—those for the head and person,—ought next to be put on, and the young one subjected to as little uneasiness and disturbance as may be, during the operation. Apparel can never prove the less comfortable or elegant in being free from complication:—a baby's first dress, above all things, ought to be soft, light, loose, warm, and most simple, and never extend more than two or three inches beyond the feet; each of its pieces held in its place by fine tapes alone; and the using of pins rejected as a practice as unnecessary as it is inconsiderate and cruel:—not one pin* should ever be suf-

* Dr. Underwood, whose professional experience was equalled only by his benevolence and other active virtues, relates with reference to the dangers of using pins in the clothes of infants, the

ferred to have a place in any part whatever of an infant's clothing, till such time as its judgment shall have advanced so far in its progress toward maturity, as to enable the innocent sufferer to point out the particular spot of its person wherein it experiences pain.

When children are strong and possess sound constitutions, they soon become exceedingly active and restless, and keep themselves in constant exercise, which promotes and increases in them the development of animal heat. It is obvious, therefore, that too warm and heavy clothes are altogether unsuitable to the conditions of infancy and childhood:—because, they determine frequent and abundant perspirations which, by hurrying the secretion of a living fluid and thus preventing its due application to its ultimate end, prove certainly inimical to the healthy vigour of the system during either of these periods. For such reasons, it is every way proper, every way requisite, that all, even infants, children, and young people, should be inured to the use of light apparel over the person, leaving the neck and breast and arms generally uncovered, and the head quite bare so soon as the hair has attained sufficient length to be spread thinly over it;—be accustomed early to sustain, without inconvenience, the alternations of heat and cold;—be habituated to bear with safety the ordinary intensities of the seasons;—

following most affecting history: “A gentlewoman many years ago informed me,” he says, “that one of her children, after long and incessant crying, fell into strong convulsions, which her physician was at a loss to account for; nor was the cause discovered till after death; when on the cap being taken off, which had not been changed on account of the child's illness, a small pin was discovered, sticking up to the head, in the large fontanelle,” or open of the young one's head.

and, in this manner, be taught to secure accessions of vivacity, strength, and activity in the growing frame.

Female infants and children, from their nervous system being more excitable than that of boys, require greater attention being directed to the seasonable regulations of their clothing, especially at the time of their passing from the state of childhood. Whatever in dress, whether from tightness or insufficiency, produces the effects of compressing the waist and chest, or favours unusual exposure to cold and moisture, has a strong and certain tendency to embarrass or absolutely obstruct the development of natural changes in the system, and thus prove the source of unhappiness or suffering through all the future stages of life. By neglecting or imperfectly discharging this important duty of managing their apparel,—a duty of humanity if they have not affection,—many frivolous and inconsiderate mothers have subjected their innocent and inexperienced daughters to regrets that could never be repressed, to miseries which the matchless fortitude of the female nature alone enabled them to endure.

Adolescence and mature age, however, are those epochs of life in which less disadvantage is experienced from the dress being imperfectly suited to the varying temperature of the seasons, or in some measure unfavourable to freedom of action in the moving parts:—because then, the perspiratory functions possess great energy which qualifies them for resisting the impulses of overwhelming causes; and then, also, the locomotive organs themselves have acquired firmness, and are less susceptible of taking improper directions. Then, likewise, the occurrence of rickets, or curvature of the spine, or distortion of the feet, and many other deformities to which the bones and flexible joints of children are often exposed through the mis-

application of clothing, cease any longer to be objects of apprehension.

Man in his old age, however, has partially lost the means of resisting the noxious influences of the atmosphere. His vital energies have sustained considerable diminution; his perspiratory organs no longer preserve their primitive vigour; the lungs, enfeebled and embarrassed, exercise their functions with languor and difficulty; all his powers indeed, those that generate as well as those that preserve caloric, are experiencing the enervating effects of decay:—but, while the senile frame has gone into this state, the detrimental force of external agents retains all its efficacy, all its baneful activity. Every thing, now, conduces to make requisite the protection of warm clothing, particularly that which is adapted most to promote the evolution and retard the escape of animal heat. Such apparel defends best the weakened system of old persons from the changes of temperature;—and, what to them is so much the more necessary as internal congestions are more frequent, assists in keeping equal the processes of perspiration, which are rendered difficult or defective by the dry and shrivelled condition of the skin.

During sleep, while the body is placed in a state of repose for the purpose of repairing its forces, it should have warmer coverings than when awake,—because its condition of quietude and rest in bed is opposed to that of activity which proves much more favourable to the evolution of animal heat,—and, because the general excitation of the body which results from moderate exercise, contributes greatly in establishing a balance between the external and internal temperature. Nature, however, has wisely provided that the maintenance of animal heat

in infants should be almost entirely independent of organic action, which they are not yet qualified to execute:—for this reason, it is proper that every young one should be carefully tended when asleep, with the design of varying the quantity of coverings according as the temperature of its body shall be found to rise or decrease. Sleeping children, as well as grown people, ought never to have any part of their persons compressed by tight clothing:—a babe in its couch, whatever that may be, ought to lie lightly and loosely covered, so as to leave it perfect freedom of moving and stretching its limbs:—its face also, whether it sleeps or is awake, should be thinly shaded from the light; but, at the same time, have the screen overlaying it, so disposed as not to intercept the accession of pure and cooling air, or in the least degree embarrass its freedom of breathing.

Temperament, the state of the vital powers, employments, and many other circumstances in which mankind find themselves incessantly placed during the course of life, produce reasons for varying the nature and form of the apparel, so as to make it the most suitable and the best appropriated to the susceptibilities of each individual. Convalescent persons ought to have warmer clothing than they, whose health is unimpaired:—such as are feeble and nervous require taking greater precautions for securing themselves from cold, than men who are strong and sanguineous:—and, the dress of people endowed with a lymphatic constitution should be more adapted to promote a genial warmth, than that of the bilious and athletic. When one part of the body is much exercised and the rest remains inactive, the latter will be uncomfortable unless covered with a larger proportion of clothes. Persons, also, who ride much on horse-back and, conse-

quently, have their inferior extremities in a state nearly motionless, ought to keep those parts better covered than pedestrians, in whom the exertion of walking occasions the development of more animal heat. The same considerations are applicable to raiment when employed for the purpose of defending the body from the effects of moisture, of heat in excess, and of the particles of matter imbued with contagious taints. Garments made of wax-cloth* form a good preservative from the influences of an infected atmosphere and contagioned objects, because the deleterious essences cannot readily attach themselves to the smooth, compact texture of that kind of dress; which, moreover, obstructs best the admission of humidity. In like manner, the workers at many various trades find safety in adopting such particular forms of clothing as include a certain tendency to diminish the pernicious results inseparable from their employments.

Experience plainly shews that much of the constitutional and moral and intellectual character of mankind depends on the nature and form of the clothing which each individual may have been made habituated to wear. According then to the propriety or unsuitableness of its ap-

* Clothes made of silk, skins, or hair, repel the electric fluid, and this faculty of theirs has been considered by some ingenious men as advantageous to the wearer's health and calculated to confine within itself the body's animal electricity:—others, no less ingenious certainly, believe it capable of being made a security from the effects of lightning during thunder storms. Ingenious however, as these very philosophical notions must be accounted to be, not one of their authors has been good-natured enough to propose a method of constructing patent silk parasols, garnished with magnetic points, and adapted in other respects for performing the office of "*paratonneres*", which means umbrellas for sheltering persons from thunder!

plication, it promotes or retards or changes or actually suppresses the development of important organs; and, consequently affects, to an extent equaling that of such changes, the manifestations of the animal and mental faculties which should be exhibited in the functions of these organs. Remarks of this kind are addressed to the consideration of parents with the object of inducing them never to forget,—that the dress should always be so constructed as not to embarrass, however slightly, the natural motions and growth of the human body;—and that, in children particularly, their clothes ought invariably to be prevented from confining any part of the person, or tending in the remotest manner to bring its necessary actions under even the slightest restraint.

EXERCISE.

EXERCISE comprehends relation to intellectual as well as organic exertion. In the present Section, it is used as a general term expressing such actions, whether habitual or occasional, as conduce best to the preservation of health or the prevention of disease, particularly during the epochs of infancy and childhood. With reference to the state in which the living machine sustains the modifications producible by exercise,—exercise itself, being the primary cause of these modifying actions, may be distinguished into an active and passive kind:—the former comprises all the spontaneous movements of the body and its limbs:—the latter includes the various circumstances wherein, as in riding or sailing, the locomotive organs are quiescent, and the diversified agitations experienced by the person are communicated to it by extrinsic means.

As, however, the best preservative and preventive effects of exercise may be materially counteracted by the state of the atmosphere under which they are produced, there should be advantage in premising a sketch of the influences communicable to the animal economy by the accidental properties of external air.

Atmospheric air, even in the hottest climates of the world inhabited by man, seldom and in small degree exceeds in its temperature, that of the animals exposed to sustain its effects:—nature has beneficently imparted to their organic constitution the power of enduring the scorching sun-beams without injury:—these are innoxious because they are uniform. It is, therefore, by means of its varying modifications and the suddenness of its transitions, that air of the atmosphere affects living bodies:—it affects them by,—its heat alone,—heat combined with light,—its degrees of cold,—the combinations of heat and cold with moisture and dryness,—the alternations of heat and cold, dryness and moisture,—and by its electrical state.

When the human frame, especially if placed in the shade, is exposed to the unusual heat of 90° to 100° of Fahrenheit's thermometer, it suffers a general expansion of its fluid and relaxation of its solid parts, has excessive perspiration, sluggishness in its movements, and a disposition to indolence and inaction. This state is invariably accompanied with intense thirst, which seems to be a natural desire of repairing in the system the loss of its fluids induced by the heat. Draughts of water taken in such circumstances, however, tend only to increase the perspirations in proportion to the quantity in which it has been drank:—this is the reason why such thirst is always aggravated instead of being allayed by even the most

cooling and refreshing beverage. When, moreover, the perspiration and evaporation from the body are greatest, its liquid secretions diminish in quantity and acquire a deeper colour. The digestive functions also become enfeebled and the appetite fails:—as the desire of drink increases, the desire of food declines. This debility of the assimilating powers is a necessary result of the general relaxation which the whole system has sustained. To the same cause, likewise, from its excitement of the hepatic secretions, is to be referred the bilious character which accompanies all the diseases of intertropical regions.

Light and heat combined produce nearly the same results in animals as in vegetables:—their influences deepen colour in the one and in the other. Each of them, when removed from shelter and the shade, becomes freckled; and, it is familiar to observation, that such parts of the human body as are exposed to the air and sun grow very sensibly darker than those that are always covered. Living fibre has its firmness and tension also distinctly augmented by the combined action of heat and light. This accounts for the circumstance of persons perspiring, more readily and more profusely, in a moderate temperature under the shade, than in the open air beneath the sun's beams, although the heat be more intense. When bright concentrated light, as that of the sun darting suddenly from between clouds, rapidly strikes the skin, it excites in the parts that form of inflammation which physicians technically denominate *erysipelatous*; and this, sometimes, extends beyond being a local affection, and is communicated, by the laws of sympathetic irritation, to internal organs:—thus, when the head is so affected, the injury may sustain progressive aggravations, and termi-

nate in a fatal lesion of the brain. Such effects of the solar rays are seldom experienced by the hardy peasant, the surface of whose body, being braced and invigorated by the incessant action of free air under the open sky, is habituated to every degree of vicissitude:—but, they have frequent occurrence in the inhabitants of towns, whose constitutions are comparatively feeble, who pass the greater portion of their time in close apartments, and thus entail upon their own selves and their progeny, an extreme sensibility of external impressions. Such persons, enamoured of a soft white skin, that certain symbol of sickliness and effeminacy, can not see beauty in the freckles and sunburnings on the faces of rustic children:—these are beautiful, however, in as far as they constitute true indications of health, and are the natural harbingers of strength and manliness.

Scrofulous infants, as these remarks would intimate, and others in whom the system is lax and tender, will derive certain benefit from their being regularly and moderately exposed to general insolation:—the sun's influences are naturally genial to every thing that lives, and will conduce much toward fortifying the constitution of such young ones, by accelerating in them the processes of ossification and the development of their muscular organs.

Simple insolation, or when it is rendered more active by concentration of the sun's rays with a lens, promotes the healing of many sores where the softness and paleness of the parts give the strongest evidence of their unhealthiness. Under popular management also, the heat of burning coals acts, in an analogous manner, in forwarding the cure of chilblains. From observation of their sensible and apparent effects, it may indeed be concluded, that

heat and light operating in conjunction, and with moderate intensity, are both stimulating and strengthening, possess a tendency to correct the relaxation and atony of the system which heat alone produces, and give colouring to the skin as well as firmness to the fibres;—but, when their action is sudden, or excessive in degree or duration, it becomes irritant, imbrown and blackens, hardens, toughens, wrinkles the skin, or inflames and destroys it:—in fine, it communicates its influences to the blood itself, which it darkens and condensates, in the same way as it heightens the colourings and consistence of vegetables. There is, therefore, in this as in all things, a middle line of conduct to be pursued; and, such being the case, those parents who seclude, under whatever motive, their infants and children from enjoying the salutary effects of the free and lightsome air, do counteract, in a direct manner, one of the best and most bountiful of nature's intentions for promoting the personal and moral dignity of mankind.

Cold has its influences on the animal economy greatly modified by the circumstance of its being moderate or excessive, and of its being sustained by the body in a state of motion or of rest:—but these modifications are exceedingly uncertain relatively to our sensations. They not only vary with regard to different countries and the diversified residences of men,—to the inhabitants of towns and the dwellers in rural abodes,—but likewise to particular parts of each individual's person. Hence it is, that such parts of the body as have been habitually exposed to the air support, even with agreeable feelings, a degree of cold which would painfully affect others habitually accustomed to coverings, if their garments were removed:—and hence it also is, that the body when en-

gaged in energetic action, labour, or motion, can perfectly well endure cold that would prove most injurious to itself if placed in circumstances of inactivity or repose.

Variation of energy in the internal functions of life often, moreover, constitutes one of the causes which change the ordinary impressions of cold upon human bodies, and diversify their sense of its effects. Debilitated convalescents sustain injury from a freshness of the air which, by persons in vigorous health, is scarcely perceptible:—the aged, also, suffer from a temperature that proves agreeable to the adult and the young:—and, it is doubtless to the extraordinary vivacity of the vital movements of infants, whose skin has not yet acquired either tension or firmness, that we should attribute the facility wherewith they can be habituated to bear degrees of coldness which to older people are painfully rigorous. In the tender age of infancy, however, the organs are by much too delicate to endure intense cold without inconveniency or distress:—and, if there are some who owe to the strength of their constitution, the power of resisting impressions disproportioned to their years, there are very many others that have become the victims of privation and wretchedness, or the caprices of fashionable extravagance. Let it be remembered then, that cold in excess is injurious to the nervous system, in the young, the ripe in years, and the aged; and, that every time a tender or effeminate person has the organs of sensibility unprotected, it will act upon them with dangerous or fatal efficacy.

Cold, when temperate, produces the general effects of lessening the size and expansion of living parts,—of moderating and diminishing the cutaneous perspiration, without entirely suppressing it,—of gently stimulating the organic fibre and augmenting its contraction over all

the body's surface, and thereby imparting firmness to its several textures,—of increasing the force and energy of all its muscular actions without weakening the flexibility of its members,—and, by consequence, of promoting the aptitude and readiness of their motions. When long-continued, it impairs the colouring quality of the solar light;—hence it is, that the people who inhabit the northern regions of Europe, where the cold is not altogether insupportable or at least not constantly excessive, are large in stature, have flaxen hair and the fairest complexions.

Protracted and rigorous cold disturbs the perspiratory functions, determines inordinate constriction of the organic fibres; and, in this way, obstructs the free circulation of the superficial fluids, condenses and indurates the skin, benumbs the muscles, impedes the motions of the joints, and thus impairs the body's pliancy and agility. These circumstances explain the causes of the inhabitants of frozen regions being diminutive in size, stunted in their shapes, and disagreeable in person. Habit, nevertheless, enables those ill-favoured mannikins, even in their own ungenial atmosphere, to acquire surprising promptitude and activity in the chase. This attainment, however, arises from their being destined by nature for such a condition,—from their being formed *by* the climate and *for* the climate,—and from their skin, thickened by the cold, becoming to them a kind of natural vestment to defend their sentient organs from the chilling impressions of the icy cold, and to prevent it from irretrievably depressing their vital heat. It is far different with man accustomed to a milder temperature, and endowed with more permeability of the surface:—he experiences, in such excessive cold, a degree of immobility and

rigidness in all parts of the system, which a multitude of coverings and assiduity in taking exercise, enable him with difficulty to surmount.

Whatever be the effects of rigorous cold on the skin itself or the tissues which it overspreads, it appears to have been wisely excluded from acting unfavourably on the internal structures of the lungs. Whether it be that these organs are indisposed by some textural peculiarity for experiencing this kind of sensation,—or whether the rapid generation of heat, produced in them by the decomposition of the vital air they receive, and augmented perhaps by the greater denseness of this air, destroys the effects of cold on the pulmonary nerves,—be this what it may, nothing is more certain than the fact, that intense cold, any more than considerable density of the atmosphere does not, directly and of itself, impede the freedom of respiration.

If the human body be exposed to excessive cold, while in a state of inaction,—or, if the cold's intensity has increased or been aggravated by the wind which purifies the air and prevents it, when coming in contact with the skin, from acquiring a milder temperature,—or, in fine, if its coverings be insufficient for protecting the body from the augmenting chillness,—then, after a paroxysm of shivering almost convulsive, rigidity of the members supervenes,—the joints move with difficulty,—the muscles appear nearly incapable of sliding over each other, or the skin inclosing them forms a hardened envelope which embarrasses their motions,—the blood itself stagnates in the cutaneous vessels,—the general surface becomes pallid or violet,—and the limbs grow benumbed, stiffen, and ultimately lose all their sensibility. This is what happens to the extremities or the more prominent

and unprotected parts, as the nose or ears, of persons riding on horse-back, in a chilling atmosphere:—but, if the cold seizes on the whole body, its unhappy victim sinks insensibly into a placid sleep, exempt from agitation or suffering,—the vital functions gradually decline,—the respiratory motions become imperceptible,—the breath cannot be distinguished,—the arterial pulsations cease,—in general, the power of motion is first suppressed at the circumference and by progressive degrees in the central organs,—every sign of vitality sustains absolute extinction,—and the person dies,—the passage from life to death being quite gradual, the moment of dissolution indefinable and the last stage of its progress altogether indiscernible.

Human life, in some authentic instances, has been thus suspended, *for several days*, without being irrecoverably extinguished. Man, overpowered with the cold and destitute of motion, sensation, and apparent heat, resembles in many respects the hibernating animals when sunk in their winter-sleep:—these remain without the smallest sign of life till the freshness of spring comes to reanimate sensibility, locomotive energy, and vital heat through all their torpid organs. When the manifestations of life have been suspended by the chilling influences of cold, returning animation,—on the body being removed from sustaining the cold's farther impressions,—is always first perceived in the propagation of organic action, from the centre to the circumference:—thus, by little and little, the heart and lungs resume their interrupted movements, and progressively diffuse heat and life from the trunk to the extremities,—exhibiting in these conservative operations, the useful lesson,* that science, in

* If,—in order to resuscitate a person whose vital functions

similar instances, ought at all times to imitate the practice of nature.

Humidity has a general tendency to relax the organic fibres and make them flabby:—it diminishes the perspiration, prompts and increases the absorbent actions of the skin, and augments the effects of different temperatures on the human frame. When humid air is cold, it appears to be colder; and, when hot, the sensation of heat excited by it seems more intense:—it is always insalubrious, in a greater or less degree. All bodies, if under the influence of moisture, are proportionately more inactive, and their disposition to putrescency much promoted.

have been suspended by the chilling influences of cold,—we hasten to warm the extremities and surface of the body, we ignorantly misapply beneficence in the employment of means which have a direct tendency to determine gangrene or mortification of the parts. This naturally succeeds to such measures, because it is a condition essential to the organic motion of all the other systems that they, at first, resume their communication with the heart as the centre of the circulation, and with the lungs as the chief source of animal heat. Hence it is self-evident, that the process of resuscitation cannot prove successful, unless true vital motion be renewed in the centre and propagated by regular advances to the circumference. While, therefore, the extremities of a person apparently exanimate from the influences of cold, are covered with snow or cloths soaked with gelid water, the chest, pit of the stomach, and regions of the liver should be steadily and perseveringly rubbed with flannel and some stimulating tincture. As the circulation of the blood and the action of the lungs come to be re-established, and the internal heat is transmitted towards the surface, successive applications of water, each made warmer than the preceding, should replace the snow; and, so soon as the patient can swallow fluids he ought to receive cordials in quantity determined by their effects. At the same time, the superficial excitations must be regulated and prolonged, by the state of the central movements and heat.

Intermittent, putrid, and malignant fevers prevail in marshy districts and those exposed to occasional inundations:—heat gives activity to such diseases; coldness renders them tedious and obstinate. Every where and at all times, humidness of the air combined with heat accelerates spontaneous decomposition, and constitutes the diffusive vehicle of those infectious particles that are absorbed by the cutaneous pores, and give origin to the pestilential maladies which abound in the vicinity of fens and stagnant waters.

Dry air, on the contrary, is almost always wholesome. It braces the system and constitution; facilitates the perspiratory and other functions of the skin; and, like every thing that favours contractility of their fibre, increases the activity of living bodies while, at the same time, it diminishes in the fluids their natural tendency to putrefaction. It is less oppressive than moist air when hot, and less penetrating than it when cold:—both these effects result from its power of restraining the cutaneous absorption. Places, in dry climates, situated remote from marshes and the margins of great waters, when elevated above the sphere of those humid vapours that nightly fall upon the plains and rise again with the morning sun, are exempted from a multitude of morbid affections, by which low and humid districts are frequently desolated. Health, stature, strength, and the courage of nations inhabiting upland countries, exhibit an instructive contrast to the personal and mental feebleness of those that dwell in low regions.

Atmospheric dryness or humidity has each its advantages and inconveniences. To certain constitutions having the fibres hard, tense, and nervous, air moderately impregnated with pure moisture proves beneficial:—it

also acts kindly on persons suffering from ulcerations of the lungs. Its moisture does not of itself prove injurious to health, but by the relaxation it induces when extreme, and by the infectious particles of which it becomes the vehicle. When humid, the temperature of air communicates itself more completely and more intimately than when dry;—and living bodies feel the sensation of coldness more intensely if the cooling air be charged with moisture. Observation of these natural effects instructs mankind, in warm countries, to reduce the temperature of their apartments by oversprinkling the floors with cold water:—and, independently of the coolness attributable to the evaporation thus induced, the freshness experienced in such places, especially if the solar rays be excluded, depends also in part on the contact of moistened air. Hence it arises, that the same temperature is felt to be warm in the dry air, and cool in the humid:—and, it is universally consistent with experience, that a moist atmosphere, whose temperature stands above the freezing point, excites a colder feeling than dry air at a much lower temperature. For the same reasons, the cuticle, which defends the nervous parts of the skin from being painfully impressed by the atmosphere, fulfils this intention best when it is dry. Moisture relaxes and dilates its pores, and thereby makes it a less exact envelope:—it then admits the external air to pénétrate, between its layers, to the sentient organs it is designed to protect.

Atmospherical temperature becomes injurious to animals only when it undergoes great and rapid variations, or is excessive,—because, then its impressions are destructive to organization. Its most hurtful change is that from heat to cold, especially to cold combined with moisture; and, generally, this does not often take place

rapidly without having its humidity sensibly augmented;—because, by such change, the relaxing disposition of the air is then made to sustain considerable diminution. Thus, the sudden cold that seizes us when the body is heated or partially deprived of its clothing, exasperates the skin and occasions a painful contraction of its texture. This irritation, by agitating the whole nervous system, produces shivering:—or, if its action be determined upon one particular spot less covered or less protected than the rest, it excites a local pain which diseases not only the skin of that spot, but also its muscles and other subjacent tissues:—or, what is more, it may be communicated to the weaker organs, may attack the chest, causing pleurisy and inflammations of the lungs, although the original irritation was in a part very remote from that ultimately affected. This explains the causes why persons having gout, rheumatism, or pains of the joints, suffer so much during the vicissitudes of the weather,—the nervous excitement induced by the united influences of cold and humidity is propagated, by a sort of preference, to the most sensitive parts, and to those which possess a susceptibility of receiving such impressions.

Besides this nervous irritation, which constitutes the chief effect of the air's abrupt change from heat to cold, another is the suppression of perspiration. Sudden cold interrupts the skin's functions; and, at the same time, increases all the fluid secretions:—it, likewise, excites the membrane that lines the nose to exude a transparent lymph, whose sharpness occasionally chafes and reddens the most healthy parts over which it flows. By this means, also, all the excretions of which water is or may become the vehicle, are in general very sensibly augmented and acquire, according to circumstances, a degree of acridness

that strongly stimulates the organs themselves wherein they are elaborated. From these facts the opinion has been drawn,—that catarrhal inflammations derive their origin from the suppression of an acrid perspirable matter and its transmission from the vessels of the skin to other organs, in which it never fails to originate excessive or inflammatory action.

Another remarkable effect of sudden cold is its determining in the blood an excess of that substance which coagulates on its surface when set at rest. This substance, so separated from the other parts of the blood, acquires under certain modifications a very great degree of consistence and tenacity. It has been regarded as fibrine altered in its natural elements, and as that matter which often forms a layer, irregular in thickness, on the surfaces of some inflamed tissues and which very frequently lines the serous membranes wherein inflammatory excitement had prevailed.

Reason might also be offered for believing that an augmentation of activity in the cutaneous absorption has occurred as an effect of the sudden change of heat to humid cold; and that, in this way, the volatile particles with which the humid air is sometimes impregnated, have been taken into the system and given existence to complications of catarrhal disease.

In these sketches, then, it is represented, that the consequences of a rapid change of the high to a low temperature may be,—a spasmodic irritation of the sentient fibres of organs, which is propagated, by a very quick communication, from the surface to central parts especially such as have been debilitated or are suffering from existing disease:—repression of the perspirable fluid which is either determined upon vital organs or enters into vessels

appropriated to other functions; and, from its nature, being unsuitable, induces derangement of their healthy actions:—a particular change in the constitutional elements of the blood, which gives rise to the formation of a membranous concretion on its surface:—and, an increased activity in the superficial absorbents, whereby floating particles of matter may be introduced into the system along with the humid air in which they are suspended.

Many circumstances promote the development of these effects, and aggravate their intensity. They are most distinct in the conditions of life where sensibility is most excitable:—old persons and convalescents are more exquisitely affected by them than others:—but, notwithstanding their extreme quickness of sensation, infants after the first dentition resist cold well, by reason of the great vivacity of their motions and of their circulation. Hypochondriacal people, independently of that internal feeling of cold which is an ordinary symptom in them, very often appear to be exceedingly uncomfortable in a low atmospheric temperature:—but maniacs, who have become nearly insensible to the impressions of all external objects, are much less affected with cold and can endure, without injury, its most rigorous influences. About four or five hours after taking dinner and at the time of leaving bed in the morning, human perspiration is more abundant and also contains a greater proportion of excreted matter, than at any other time of the day when the cutaneous exhalation is a simple, inodorous, nearly imperceptible evaporation;—on these occasions, therefore, a too rapid transition from heat to cold, particularly humid cold, is most dangerous. When the perspiration itself includes an acrid principle, as that of gouty patients, its suppression by cold may induce fatal consequences.

Children shedding dry crusts from the head or having a watery exudation behind the ears, females in confinement, and red-haired persons sustain, at all times indiscriminately, the most serious accidents from sudden repression of their perspiratory functions. When any determinate part is the organ by which particularly acrid perspiration is elaborated and exhaled, there is imminent danger in interrupting that organ's natural actions. In fine, the intensity of their effects is always corresponsive to the rapidity wherewith the passage from heat to cold has been made.

Abrupt transitions from cold to heat do not act so injuriously on the living frame as those from a high to a low temperature:—if, however, such changes have been great or sudden, they are capable of determining very deleterious effects. If a person, in whom the action of a freezing cold has overpowered the movements of life, be suddenly placed in a warm temperature,—the surface of the body becomes heated before the central and vital organs have regained their functions,—the frozen fluids suffer expansion, rupture their vessels, are extravasated, and partially diffused in an exanimate state into the nearest cellular parts which they darken,—and the solids themselves undergo a manifest softening before being penetrated by revivifying action, become as it were separated from life, and the alteration they sustain in this condition destroys their organization. If the living powers be now resuscitated, ulcers are produced in the morbid parts, and quickly assume a gangrenous character:—sometimes entire members have their vitality extinguished:—and, if nature be not able to determine, in the vicinity of such mortifying structures, that healthy re-action which detaches a dead from the living parts,

the gangrene speedily extends its ravages, particles of the vitiated solid and fluid essences are absorbed into the circulation which transfuses the poison over all the sources of life, and death inevitably ensues. Bad sores are very often occasioned by subjecting the affected parts to the heat of a strong fire, in cases of local and superficial frost-biting:—these have a particular tendency to degenerate into malignant and putrid ulcers which obstinately resist the best treatment; and, by becoming the subject of insalutary absorption, give birth to general affections of the most enervating and inveterate kind.

Sudden passage from ordinary coolness into excessive heat is generally accompanied with a marked revolution in the whole system:—expansion of the fluids, especially of the blood which is thus made to distend its vessels, suffocation, swooning, apoplexy, may be the results of such transitions. If the stomach contains much food, the operations of digestion are disordered or interrupted, oppression of the vital energies is experienced, and this central disturbance itself alone not unfrequently produces an apoplectic seizure:—such occurrences, however, seldom have place except as the effects of artificial temperature.

Sensible impressions are made on the human body, by its passing from a dry into a humid atmosphere:—it has a general feeling of weight arising from what is usually called a dulness of the air. The locomotive organs, relaxed and softened by the moistening air, become enfeebled and averse from motion;—the system loses its tone:—the vessels yield to the expansive force of their fluids and their impulsion on the vascular ramifications:—and, without its weight being increased, the compressing power of the atmosphere has augmented in proportion to

the diminution of the body's force and capacity of resisting it. In this way, the vernal influences cause the whole frame to pass from its state of constriction, induced by the cold of winter, to that of relaxation which results from the action of humid warmth; and, by necessary consequence, render it more susceptible of the diseases that arise out of such a condition and are peculiar to spring.—It is worthy being remarked,—that these diseases are, generally, less obstinate than others in their resistance of medical treatment:—this peculiarity evidently depends on the facility with which evacuations of all kinds can then be renewed or augmented.

Mankind generally experience agreeable or beneficial effects from being removed into a dry atmosphere out of one wherein humidity predominated:—the former braces all the vascular extremities, restores to the fibres their lost tone; and, although generally accompanied with an increase of weight in the atmosphere, the surrounding air is felt as being lighter; heat seems less oppressive; cold less rigorous.

Being almost always encompassed by the unceasing play of atmospheric electricity, man cannot remain unaffected by its impulsive powers. If he stand in the passage of this fluid at the moment of the thunder's explosion,—that is, at the instant when the disbalanced relations of the atmosphere and the earth are rapidly equilibrated,—he sustains a general shock which may be so violent as to cause immediate death. Independently, however, of this forceful action of the electric fluid, living bodies experience from it other effects which are far less perceptible:—its sphere extends to some distance, and its influences are perceived beyond the range of its discharge:—and these influences affect a person, in various ways and with var-

ious intensity, according as the constitution has been characteristically modified by nature or by habit. From this predisposition, many individuals sustain very sensible impressions of them, a considerable time before the occurrence of thunder-storms and the prevalence of lightning; and, from the general sense of discomfort, depression of the vital and mental energies, qualmishness, headache, and nervousness, which then annoy them, can with surprising accuracy prognosticate the approach of an electric state of the atmosphere. Relatively, however, to the action of the electrified air, at a distance from animals, very few observations, and these altogether of a general nature, have yet been collected.

Since, then, the qualities of the atmosphere are chiefly hurtful by reason of their abrupt vicissitudes and become dangerous only when allowed to act on bodies not accustomed to them, or because these qualities themselves are sometimes deprived of their salutariness, it is indispensable to the conservation of health that mankind should endeavour to fortify their persons against its influences and familiarise their constitutions, not to a temperature from which they may soon be removed, but to one whose effects they are most exposed to sustain. Agreeably to this view, consequences of the worst kind may ensue from the practice of persons confining themselves much in close and heated houses, during the cold seasons or in cold countries:—and, similarly prejudicial results, though generally in a less aggravated degree, proceed from the inhabitants of hot climates passing a great portion of their time in the seclusion of refrigerated apartments. Cold is the state of temperature to which, above all others, it is necessary that the human frame be early and perfectly inured:—because, it fortifies and braces the system, and

imparts a solidness and vigour to the body by which it is enabled to resist the effects of every rapid change whatever of the atmosphere:—and, because sudden exposure to its impressions conduces most in disbalancing the uniformity of the vital functions. Parents should, therefore, accustom their young ones to bear its influences, by gradual advances. Few constitutions, indeed, are sufficiently powerful to sustain without injury the force of sudden transition from a mild to an inclement temperature:—every constitution, however, is susceptible of being made progressively habituated to the action of cold so intense as, in other circumstances, would be intolerable.

New-born babes, who have the cuticle imperfectly formed, and are just past from being suspended in a fluid at the temperature of 95° to 100° to breathe a new atmosphere, remain for some time exceedingly nervous and impressionable:—consequently, the tender younglings require being protected from cold with a degree of care proportioned to their feebleness and sensibility:—when delicate, they bear its action ill; and, greatly worse, when diseased. During the first six weeks of infancy, many precautions are necessary for keeping them in proper warmth:—that communicated to them by their mothers, in being the most natural, is also the most genial. If they are nursed in close warm rooms, particular attention will be requisite for defending them from being chilled by the external air, when first exposed to it, especially in the afternoon and morning. If, as infancy advances, the child continues vigorous and undiseased, it should be inured, by degrees, to receive the bracing influences of a cooling atmosphere;—only, during the progress of teething, some additional sheltering may be desired. If, however, it be weak or sickly or have eruptions on its head,

warminess and careful watching are indispensable to its safety:—and, if dentition should commence under such circumstances, it must be still more tenderly fostered and shielded from the effects of cold. Should, moreover, the young one's head remain, till this time, familiarized to the use of coverings, these ought not to be discontinued:—it is now that the nervous system is exposed to suffer, especially the nerves of the head; and, said the Father of Medicine, “cold is the enemy of the nerves.”

By the end of the second year of infancy or, at latest, when the first dentition has been completed, parents ought to begin directing their serious attention to the employment of the means best calculated to invigorate their children and make them hardy. It is then, that leaving the head bare,—having their apparel easy and light,—using frequent and free washings with cold water,—and keeping them in airy rooms, at a distance from the fire, contribute very efficaciously to the improvement of their organic and constitutional vigour. Then, also, the body's activity and that peculiar force which impels the blood through its vessels, combine in enabling the system to resist the more ordinary impressions of cold:—and, the cuticle, becoming firmer, forms an appropriate shelter which preserves the infantine economy much better than a multitude of garments, by rendering it less sensible of the irritation which cold inflicts on the nerves when unprovided with this natural envelope.

When a young person has acquired a constitution thus invigorated, it behooves him to endeavour, with the most assiduous and constant care, to secure it from being injured or subverted by luxury and idleness, or by the moral depravity with which all populous places unfortunately abound. Effeminacy, excess of every kind, indisposi-

tion, disease, whatever chagrins the mind or embitters the temper, all the passions indeed, are prone to exasperate anew the nervous sensibility, and render man susceptible, as an infant, of external impressions:—but, reciprocally, the individual who has been inured to sustain the influences of extrinsic agents, is not readily enervated by the indispositions which circumstances may prepare for him; he is less disturbed by chagrin, less agitated by passion; his sensibility places him in unison with the moral affections as well as with physical impressions.

All those infirmities which weaken the human frame, by diminishing the vigour of its circulating fluids, particularly of the blood, or by disbalancing the equality of its vital heat and distribution from the central to the superficial parts of the body, require great and unceasing precaution being taken for securing it from all hurtful impressions, especially those of the cold, more especially of the moist cold air. Such precautions are quite indispensable to the well-being of aged persons and those recovering from disease. It is quite consistent with observation, that absorption, particularly in such as have been ill and in those who have sustained excessive evacuations, becomes proportionally exalted as the impulse of the vital fluids is depressed:—this is a principal cause why, to such persons, the cold humid air proves so invariably pernicious, and why exposure to it renews with such readiness the paroxysms of febrile, rheumatic, and other affections distinguished by an intermitting character.

Finally, then, if parents do neglect adopting the ordinary and simple means of fortifying the constitutions of their children against the external impressions to which they always are and will incessantly be exposed;—and, if young persons, by their own fault or that of their

guardians, are allowed to pass the age when right habits should be contracted, it then becomes requisite,—that such helpless and neglected beings should submit to the laws by which the sickly and infirm are necessarily obliged to regulate the management of their unhappy circumstances;—that they counteract, by means of appropriate dress and exercise, the influences of great and sudden vicissitudes of the atmosphere;—that they avoid these, not only according to the alternations of the seasons and the natural divisions of the day, but still more according to the periods of their own proper functions, the times when digestion is proceeding, when the perspiration requires unusual attention, especially if it has a peculiar acridness;—and that, if they are unfortunate in having local affections of the skin, or exhausting discharges from whatever source, or excess in the natural evacuations, their vigilance in precluding the effects of rapid atmospherical transitions ought at all times to be carefully re-doubled. Thus, as atmospheric air is one of the most pervasive elements in nature so it is one of the most influential on the animal economy,—whether it be flourishing in youth or waning in age, blooming in health or languishing in disease, determining particular effects, reclining in inaction, or recruiting its forces in slumberings and repose. Its properties, therefore, naturally tend to affect the different modifications of exercise which may be employed for the purpose of invigorating the vital functions and, by consequence, to affect the circumstances of these functions themselves:—hence it is, that exercise the most appropriate may have its beneficial effects improved or counteracted by the atmosphere under which it is practised;—and hence, as the temperature of the atmosphere and its interminable vicissitudes are altogether beyond

the control of Man, it behooves him to employ his best resources in qualifying himself and his young ones to bear that in the atmospheric influences what he is unable to remove.

Exercise, in the multiplicity of its relations to living nature, comprehends many subjects which merit the attention of all considerate minds. Among others may be represented,—the causes which impart to the body's spontaneous movements the power of altering the actual order of the functions of life;—the various kinds of action wherein exercise consists;—the organic changes it determines in the animated machine;—the effects produced by it when excessive either in degree or duration;—and, its advantages in preventing, mitigating, or removing disorder or disease.

Locomotion is subservient to the power of volition; and, it is by successive and methodical applications of the muscles, which constitute the locomotive organs, that the different actions of walking, running, dancing, leaping, and the like, are performed. These voluntary operations of the animal machine, cannot have place however, without the internal functions,—digestion, circulation, respiration, secretion, and excretion,—changing their actual tenour and having their activity increased:—thus, the movements of the muscles which execute the different acts of locomotion are so intimately connected with the organs on whose functions the processes of nutrition depend, that the former always excite and accelerate the latter, when they themselves are required to perform their natural actions.

Muscles, which are the direct agents of voluntary motion, have a necessary union with the chief organic apparatus of the system. If the principal trunks of the nerves

distributed to a muscle be divided, that muscle instantly loses the locomotive faculty; it becomes completely palsied. When, on the contrary, the brain has been roused into a state of intense excitation, the general nervous influence is consequently augmented, and the muscular actions are more developed and more energetic. Let delightful information be imparted to a person who, at the time is sedate and tranquil, and he will soon become unable to remain in this condition;—he will rise, walk, return to his first posture, keep in incessant motion, and experience as it were a necessity of using the excess of life which his muscles have just received.—The muscular system is equally connected with that of the circulation;—and, no sooner has the communication which exists between the heart and muscles been intercepted, by tying a ligature round the arteries, than the muscular tissues, ceasing to be supplied with arterial and vivifying blood, have their contractile property gradually diminished and ultimately extinguished:—but, if the circulation be accelerated, if the arterial blood enters with increased force into the muscular masses; their contractile property acquires more energy, their movements are freer, and their actions more powerful.

There exists, then, a constant relation between the activity of the nervous and arterial systems, and the activity of the muscles which produce locomotion; and, it is in the material and vital connection which unites these parts that other very important results originate. The muscles obtain the principles of their activity from the nerves, and the blood transmitted to them by the arteries;—and, in return, they cannot move without re-acting, through the intermediacy of the arterial vessels and nervous cords, upon the heart and brain;—the muscular contractions

exercise a true stimulating impulsion on the internal organs:—they augment their vitality;—impel them to partake of the activity of the muscles;—and, in this way, arouse a general excitation in the whole animal economy. In this intimate association of the muscular tissue with the nerves and arteries, moreover, is to be found the principal cause of that excitement which determines walking, running, dancing, fencing, as well as the frequency and quickness of the pulse, the development of animal heat, perspiration, redness of the cutaneous surface, and blushing. These corporeal exercises, however, induce another series of important effects, the nature of which may be usefully explained.

When persons walk or run, they advance the body forward, with a certain degree of velocity, and place it alternately on either foot:—consequently, at the instant when the lower extremity, which receives the weight of the body, touches the ground, a shock more or less strong is produced:—the sum of the motion which the muscular contractions then impart to the living machine is, at the same time, reflected upon it:—and, this repercussive action penetrates the whole frame, is distributed to all the organs, shakes the universal system, and agitates the minutest fibres of which it is composed. These concussive shocks of the substance of organs are illimitably multiplied;—they are repeated at each step, at each leap:—they exert an incontestable influence upon the textures which execute functions:—and, the mechanical agitations, produced by them in vital parts, change the internal disposition of these parts, determine a concentration of their fibres, and thereby render them more active and more powerful.

This distribution of movement over all the organs, in

the actions of running, walking, leaping, passes without observation in a natural state of the system; but, it comes to be perceived in a very evident manner when inflammatory excitement has exalted the sensibility of an individual texture or membrane of the body:—then, the centre of motion in the morbid part always experiences distress, sometimes intense pain,—the effects of the repercussion vibrate through all the inflamed fibres and seem to be felt only in the one affected point. Reflexion of movement, then, is a natural circumstance susceptible of the easiest demonstration:—it becomes quite manifest when, in walking or running, a person holds pressed against the body, a vessel partially filled with water;—each step occasions a displacement, an agitation of the fluid.

Rightly to understand the degree and the nature of the influence which all his spontaneous corporeal movements exercise upon man, it is necessary to unite the effects of those mechanical agitations which his organs sustain, with the effects of the connexion that exists between the actions of the muscles and those of the brain and heart. This influence, then, emanates from two causes,—the exciting impulse which the muscles, by their contractions, impress upon the nerves and the arteries and, by consequence, on all the various systems of organs,—and from the concussions each successive displacement of the body makes all its living tissues to experience, together with the development of the tonic forces which is their natural result.

Exercise, it has been said, may be of an active or passive kind:—the former comprehends many diversities of muscular exertion, each of which, by its peculiar mode of action, gives rise to particular impressions in the animal

economy:—those produced by walking, running, dancing, pursuits of the chase, fencing, various games, swimming, and the different uses of the vocal organs, cannot be unworthy of brief consideration.

Walking exerts a double influence on the actual state of the system. Persons, in taking this exercise, make alternate contractions of the bending and extending muscles of the thighs and legs, and these contractions are repeated with a degree of quickness corresponding to the rate of velocity at which the walkers proceed. These muscular masses some of which are very large, cannot however, as has already been explained, commence acting without, at the same time, re-acting on the brain by means of the nerves, and upon the heart and lungs through the intervention of the arteries. Walking, therefore, has for its immediate results,—an acceleration of the blood's motion, increased strength and frequency of the pulse, greater quickness of breathing, an augmentation of animal heat, and indeed a general excitement of every organ:—and, all these effects are proportionally distinct and exquisite as the speed of walking is rapid and, consequently, as the alternate contractions of the bending and extending muscles of the lower extremities, are fast repeated.

Besides this impulsion communicated to all the organic systems by the action of walking, it likewise subjects them to the influences of mechanical agitation. All the weight of the body, in walking, is successively made to rest first on the one and then on the other limb. Now, at the instant, when each foot comes in contact with the ground, a shock takes place and all the vital frame sustains an agitation:—this is very considerable if the person walks quick, takes long steps, or passes over hard rough

ground:—but, it is feebler, if he proceeds slowly, treads on a soft or grassy surface, or poises his weight on the toes, when the joints of the ankle and foot conduce to weaken its force. Every one can discern the motions induced in the cheeks of those who, with the mind engaged on other objects, go carelessly over a rugged field:—these agitations and shakings of the cheeks represent, in some measure, the occult effects determined by the same cause in the more important though invisible organs. It is also consistent with experience, that an unexpected fall, with the sole of the foot lighting over a cavity however shallow, occasions a shock which, in some instances, has been so violent as to produce laceration of the liver and very dangerous lesions of the brain.

Walking, then, influences the body by two kinds of action:—by the muscular contractions augmenting the activity of all the vital parts:—and, by the concussions which, pervading these organs, tend to produce a condensation of the fibres composing them, and thus to promote their firmness, their tone, and their energy:—it is by this double effect that the exercise of a daily walk proves beneficial to the constitution. This, therefore, is a certain means of enlivening the appetite, forwarding both the assimilative and the excreting operations of digestion, facilitating the blood's distribution over all the living frame, maintaining the natural tenour of the secreting and exhaling vessels, and indeed of supporting a salutary equipoise between the fluids and the solid structures. Additionally to these, its direct influences on the vital nature, exercise or spontaneous movement is the source of other effects. Walking in the open fields or among the clear glens of the hills, in the alleys of airy woods or along the banks of unshaded streams, brings a person into

an atmosphere, at once pure, salubrious, fresh by incessant renovation, and impregnated with the odoriferous emanations of flowers that, in summer, cover the face of the ground,—into an atmosphere which, thus modified, determines a stimulating impression upon the lungs, and an exaltation of the nervous energy, having tendency to disseminate vivacity over the whole animal system. Such exercise, moreover, entertains and charms the mind by the diversity of agreeable objects it brings under the walker's observation; it delights the heart by the ever-varying scenes which the wide face of nature enables him to contemplate; and, in fine, it contributes to awaken in the soul a calm sense of joyousness and satisfaction, a universal feeling of happiness and philanthropy.

Running produces effects on the body which originate in the same sources as those that walking determines. Very lively and rapid contractions of the muscles of the thighs and legs, and even of the back and neck, form its necessary results. This extreme activity of the muscular masses is propagated throughout the system;—it constitutes an impulsive force which excites their vitality and accelerates their movements;—it increases the pulse's strength and frequency;—by it the animal temperature is elevated, the skin reddened, and the cutaneous exhalation made to issue in profusion.

In running, the body is projected upward and forward; the hindmost foot is raised before the other, for the purpose of sustaining the body, has reached the ground; and, when this takes place, a violent shock is communicated to the whole system and agitates all its parts. These concussions, moreover, succeed one another with great rapidity, and the substance of each organ thereby finds itself almost unintermittingly commoved and shaken. That

power which walking and running prompt into action, differs merely in degree;—in the latter, it is more extensive and vehement. Their effects also are nearly similar;—only those of running have a particular intensity, an extreme violence:—they do not produce a mild and moderate excitation, but a kind of feverish disturbance having something in it that is unnatural and prone to originate disease. Every day affords instances of the invigorating, exhilarating, and even healing influences of walking, but those of running are generally regarded as being inimical to the regular continuity of vital action:—nevertheless, there may be particular cases, wherein running, moderate in degree and limited in measure, shall be found useful in preventing some, and in helping to moderate other, unhealthy conditions.

Dancing was employed by mankind, in the primitive ages, as an expression of reverence and gratitude to the divinity. Many ancient legislators, also, inculcated its being frequently and publicly practised, as an exercise naturally favourable to the development of young organs, and to the promotion of vigour and activity in the growing frame. It combines all the movements of walking, running, and leaping; and, through the instrumentality of the locomotive contractions by which it is produced, it imparts a high degree of excitement to the heart, the lungs, the brain, and to every other part which constitutes a source of vital action.

By the exercise of dancing, the living system is susceptible of being variously affected:—its practice hurries the circulating elements in their course, accelerates the pulmonary movements, and induces an active flow of the perspiration. This excess of the cutaneous discharge induces a great consumption of the animal fluids, which

manifests its effects in a consequent thirst that, according to circumstances, may be more or less intense. Desire of nourishment is also awakened and promoted by it; and this is a consequence either of the agitations sustained by the digestive organs, or of the rapid abstraction of the body's material principles, which require an equally rapid supply:—thus, it may be made conducive to the restoring or improving of the appetite and to the perfect assimilation of food.

In those who have perfected themselves in this exercise, dancing gives the body an agreeable and easy air, and enables it to move with grace and freedom. By throwing back the arms and shoulders, it advances the chest, renders it more capacious, and consequently more favourable to the actions of the heart and lungs. It also imparts strength and pliancy to the limbs, turns out the foot into its natural position, and braces the muscles of all the lower extremities:—it, in fine, confers on the gait a particular air which is readily recognizable in persons who excel in such accomplishments.

Youth is the season of life when motion is indispensable:—at this time, the very act of expending the vital energies becomes the most appropriate means of renewing and invigorating them:—to the circumstances of growing persons, therefore, dancing is most applicable. It proves exceedingly beneficial to the conditions of young females, especially of those who have soft and delicate constitutions, by counteracting the effects of that inaction which the indiscriminating refinements of society impose on them. By its power of inciting perspiration, of procuring the rejection of what in the fluids is excessive or depraved, and of fortifying the general economy, it may be successfully employed as a remedial agent in a

multitude of complaints,—in obstructions, indigestions, and all scrofulous and nervous affections.—Well-timed dancing, in fine, is a natural, an elegant, and a salutary exercise which, under wise management, can be made particularly subservient to the perfecting of man's intellectual as well as his personal attainments.

Field-sports constitute to persons on foot a kind of exercise which calls into action all the essential organs. Those who enter into such pursuits are obliged sometimes to walk, sometimes to run, sometimes to leap, sometimes to be standing, sometimes to have the body curved, sometimes to utter cries:—now all these spontaneous movements cannot be executed without inducing variations in the actual state of the internal functions. The muscular contractions brought into requisition by them, impel the heart, the large arteries, and indeed all the pulses into greater activity, elevate the animal temperature, and accelerate the functions of the skin:—at the same time, the frequent agitations sustained by the living tissues renew their tone, and impart to them fresh energy and vigour.

Such employment also makes impression on the body by means of the fascination with which it engages the mind. Besides the pleasure he naturally derives from the contemplation of rural beauty and sublimity, the hunter finds opportunity of participating in a multitude of peculiar enjoyments:—the arts practised by the game to avoid the snares laid for them; the curious, often astonishing, devices opposed by animal instinct to the stratagems of human reason; his own hopes and fears; his successes and disappointments, all combine in deeply interesting his mental feelings and, through them, the organs by which such feelings are perceived. Boys, therefore,

and young men, when these sports of the field are attainable, ought to be systematically inured to them as being adapted, in a decisive manner, to invigorate and mature the energies of their sentient and perceptive natures.

Many diseases yield more readily to the remedies administered for their cure, when these are assisted in their operation by a moderate employment of this inspiring exercise:—morbid affections distinguished by atony of organs, relaxation of texture, or deficiency of the motive powers, obtain a marked amendment from its exciting and tonic influence. Dancing and the chase have this remarkable in them;—that, being regarded as amusements, they fatigue ailing persons less and are less irksome to them, than those exercises to which they submit by restraint, or in obedience to the prescriptions of their physicians.

Fencing requires a vigorous and almost unceasing action of the muscles of the arms, trunk, head, and inferior extremities. In practising it, the body is carried backward and forward with great vivacity, and strong concussions are incessantly sustained by all parts of the fencer's person. Hence, it produces very distinct organic effects:—it speedily puts the whole living machine into a state of the most intense excitement:—the countenance beams with animation; the eye sparkles with penetrative brilliancy; and the manifestations of life and energy and generous ardour, become impressively apparent. By the changes which it determines in the natural course of the functions, it may be made beneficial in those circumstances of unhealthiness where an instantaneous and lively agitation of the person, the communication of an exquisite impulse to the circulating system, or a profuse exhalation from the perspiring vessels, is indicated.—

Wrestling, in fine, and fencing and all the various forms of self-defence, when acquired under appropriate tutorage, do conduce very much towards imparting an air of grace and nobleness to the mien and an air of benevolence and firmness to the character:—this kind of exercise makes the body strong and healthy, the mind patient and generous; and, being endowed with such important tendencies, it ought not, without the best reasons, to be excluded from constituting a material branch of the youthful discipline.

Games at hand-ball, foot-ball, tennis, shuttlecock, and others of a similar nature, oblige the players to run and leap with earnestness and frequency. All the body is then in motion:—not only are the locomotive muscles kept in constant action, but the head, the eyes, and even the organs of voice require, at the same time, a certain application. Now, this exquisite activity of the external, is disseminated to all the internal or vital systems:—each of these has its action accelerated, and the general functions of life proceed with increased promptitude and strength. These sports, then, tend directly to preserve and invigorate the health, to refresh the young mind for the renewal of its studies, and to promote the vivacity of its powers.

Except when immoderately used, the quoits, bowls, nine-pins, and other juvenile games of a like kind, do not introduce changes into the organic functions that are unfavourable to health:—they awaken its energies and consolidate the general system.—Billiards, although too frequently subjected to the degradation of being made instrumental to the vulgar and mischievous purposes of gambling, is of itself and always ought to be an elegant and ennobling amusement:—it calls forth a great variety

of mental and corporeal actions whose natural tendency conduces, in a direct manner, to dignify the vital, the moral, and the intellectual powers of mankind.

Swimming, with the practice of which every young person should be conversant, occasions all the muscles, especially those of the limbs and arms, being put into a state of considerable activity which has the effect of accelerating the movements of the heart and arteries, and of augmenting the influence of the nerves in every part of the body. As the water, however, presents very little resistance to the actions of the members, this exercise produces none of those concussive agitations which result from running or leaping, and consequently is less influential on the universal frame. Nevertheless, it is distinguished by an effective peculiarity:—the fluid in which the swimmer keeps himself buoyant, surrounds his person and compresses it on all sides; and, to the mechanical impression arising from this circumstance, is added another derived from the temperature, cold or tepid or warm, of the element wherein he float:—hence proceeds a twofold action capable of inducing a diversity of organic variations, the general tendency of which is to invigorate the organs themselves and to render the whole system more robust.

Declamation, reading with a loud voice, and singing, were advised by many ancient philosophers as very efficacious antidotes to the progress of disease in not a few of its troublesome forms. They act directly on the pulmonary organs, and when moderate, tend to strengthen them. Reading aloud, at stated intervals and for definite spaces of time, has proved decisively beneficial in threatened consumption:—in chronic affections of the lungs themselves also, and in cases where these were in-

active or loaded with mucous matter, it has been followed by the happiest results, particularly if repeated several times in the day and continued only so long as not to induce fatigue. These exercises of the voice, moreover, extend their influences to the abdominal organs, especially those of assimilation and excretion, by means of the alternating re-actions of the diaphragm, which, in this way, conduce in animating their vitality, increasing their activity, and invigorating their functional powers. Independently, however, of their effects on his personal conditions, as mere modifications of salutary exercise, elocution, recitation, and reading, contribute immediately and most powerfully to the exaltation of man's rational constitution:—they impart to him knowledge, the characteristic glory of his intellectual and imperishable destiny:—they give him knowledge of himself, of universal nature and of Nature's God;—they give him knowledge of things that were, of things that now are, and of things that have yet to be:—they fit him for accomplishing meritorious actions in this world, and prepare him for the enjoyment,—in modes of existence that await him,—of knowledge ever increasing and ever desiring; for the enjoyment of bliss, pure as his own renovated being, and interminable as his immortality.

Such, then, are some of the principal exercises denominated *active*, by which young persons, under the guidance of paternal affection and experience, may have the perfection of their thinking and acting faculties promoted or matured:—it is now requisite that a summary view of the benefits derivable from those that are *passive* should be subjoined.

Passive exercises are those by which the body receives from a cause extrinsic to itself, a proportion of movement

sufficient to agitate the substance of its organs:—such causes always leave, in a state of rest, the locomotive members and the muscles by which these are propelled. Spontaneous exercises cannot be accomplished without the instrumentality of the muscles. Being connected, on the one hand, with the brain that animates them, and on the other with the heart that transmits to them the blood from which they obtain the principles of their vitality, the muscles themselves cannot commence acting without exciting these primary organs and, through them, the whole animal system:—in the passive exercises, however, this important and characteristic agency has no place; its effects are not even discernible in persons undergoing locomotion on horse-back or in a carriage:—nevertheless, their particular manifestations proceed from a cause distinguished by true influential properties.

While sustaining passive exercise of any kind, the body rests on a movable base,—a carriage, for instance, or a cradle:—this is displaced or carried forward by a certain amount of locomotive power; but, at every instant as it advances, a number of concussions take place between the base and the ground:—this motion is next rebounded; it traverses the machine, and every thing it carries, immediately experiences a corresponding agitation. When a person rides on horseback, he sustains shocks of this kind which are incessantly repeated:—being reflected, they successively pervade his whole frame; and, like particles of diffusive matter, are propagated over all his members, penetrate all his organs, shoot through all the different textures which compose them, and ultimately affect their minutest fibres. This repercussion of movement acts as a true force, an effective power:—it imparts to the body, as if it really had a material form, a propor-

tion of reflective influence, which is diffused over all the organic systems, and each of these is affected by it to an extent bearing relation to its individual size and weight. These mechanical impressions, these influential efforts occasioned by the successive shocks, determine a change in the actual state of the vital parts whereon they make, as it were, an aggression to which the parts offer resistance by taking on a greater or less degree of self-contraction:—thus, by putting themselves into less space, they appear to prepare a natural opposition to these re-iterated attacks which threaten to lesion their textures. Excited by the agitations they experience, the living fibres are compressed or condensated;—the organic tissues, which the fibres unite in forming, become stronger, more compact, more robust:—and, consequently, the organs themselves acquire greater energy, their motions are made freer and more vigorous, and the exercise of their respective functions is rendered easier and more perfect. Such really are the immediate effects, the sensible changes which the passive exercises produce in the animal economy. Whether, therefore, they be considered as salutary or medicinal agents, they affect the person undergoing their influences, in the same way as tonic remedies, and they effectuate the same results:—in all organised structure, they induce a constriction of its fibres:—this strengthens its tissues:—and this again contributes to render the whole fabric, at the same time, more firm and more powerful. Like the active exercises, however, they do not determine an excess of organic movement, nor accelerate the arterial pulsations, nor increase the development of animal heat, nor inordinately stimulate the cutaneous functions:—they act only in bracing and firming the living parts, and in effecting an augmentation of their inherent forces.

Passive exercise, in the form of dandling, patting the back after sucking, and friction of the spine, is indispensably requisite to the circumstances of infants.—When awake and unengaged at the breast, they require being kept in a state of nearly incessant movement. For this purpose they ought, during the first weeks of life, to be placed on a soft light pillow or similar contrivance, and in this way submitted to gentle and frequent agitations, both on the knee and in the nurse's arms. Subsequently, it is proper to exercise them in an upright posture, by tossing them up and down on the hand, with a degree of activity regulated by the young one's strength and vigour. These abrupt movings are exceedingly useful in prompting the natural desire of nourishment, in facilitating its ultimate applications, and in diffusing freely and universally, through all the organic systems, the energies of life and growth. Infants confined much in bed or the cradle and, of course, seldom subjected to this kind of discipline, so acceptable to their instinctive desirings, are always particularly soft, feeble, and pale, and generally predisposed to relaxation of the system, to obstructions, and other forms of sickness dependent on, or complicated with, nervousness and constitutional infirmness:—on the contrary, these have more strength and vigour, who are often carried into the pure fresh air and sustain such dandlings and shakings in their nurses' arms as prove sufficient, by commoving all their organic textures, to excite their vitality:—at the same time, the colour of their complexion and the firmness of their fibres all announce that in such children, the nutritive functions enjoy much activity.

Patting children with the ends of the fingers, all over the back and loins, especially on the region opposite the stomach has, along with a general usefulness, the particu-

lar and local effect of invigorating the digestive and excreting functions:—hence, the advantage of having this little operation frequently and aptly performed.

Friction of new-born babes assists in removing the albuminous deposition which originally covers the body's surface, in bringing its newest functions into action, and in extending the development of animal heat. It may be performed with a flesh-brush, or piece of linen or cotton cloth, or flannel; but the warm hand of the nurse or mother is both more natural and more appropriate. Its common and more uniform tendency, as their days advance, is,—to promote the secretions, to excite in the soft parts and cellular membrane a kind of vibratory movement conducing to their health, to strengthen the forces which impel the circulating blood so as to cause their sending an abundant supply of it to the discerning vessels, and to disembarass the different systems of all insalutary excess of nutrition. By such means, it serves to maintain an equal tenour in all the vital actions and thereby gives a favourable disposition to the child's organization and growth.

Cradles have, in all ages and in many countries, been used as the beds whereon infants are placed either for repose or sleep. Notwithstanding this apparent sanction of their superiority by very general experience, however, a common couch or crib is in many respects preferable. If parents do resolve on adopting a cradle for the resting place of their young ones, they ought to be exceedingly careful of not covering them with too many clothes, or of arranging these so as, in any way, to confine the limbs, interrupt the breathing, or occasion the person being subjected to bear too great a degree of warmth. It is a practice that alike indicates great want of thought and

greater want of feeling, to put a babe, retaining its entire dress, to sleep in a cradle and to confine it there for hours under a load of bed-clothes, till it is nearly suffocated with heat and drenched with cutaneous moisture; and then, while in this unfavourable condition, to remove it without either concern or precaution into the place's more open and cooler atmosphere:—in the first instance, it is thrown into an unnatural state of heat and oppression; and, in the next, is exposed to be injured,—and many children do imperceptibly sustain deep injury,—by the action of common air on the relaxed person whereby its superficial vessels are sometimes irremediably constricted, and an excess of blood, having tendency to induce fatal effects, determined internally upon the liver or other important organs. Whether children, therefore, be couched in a cradle or a crib, it should be the principal and constant object of their nurses' attention, to secure for them a uniformity of warmth and a uniform freedom of motion in their members, by varying the quantity of their coverings as circumstances may indicate:—when awake, their restlessness and vivacity serve to maintain in them a due degree of animal heat; but, if additional clothes require being placed over them when asleep, the proportion of these ought to be exclusively determined, not by custom or carelessness or caprice, but by frequent and circumspect examination of their personal temperature.

Since cradles have ever been, and doubtless will always be extensively in use, other circumstances connected with their substitution for infantine cribs or beds, beside their tendency to melt or smother the sleepers in them, deserve consideration. During the day, these portable couches should never be placed in a strong light;

because, by shining on the face, this causes the waking-child to wink often and may, by frequent repetition, become the means of confirming such a habit. Not one of the sides moreover, but either end of a cradle ought to stand opposite a window; for the reason that, when the light comes obliquely on the countenance, the eyes are naturally directed towards what has brightness and, by occasioning one of the eye-balls to be often turned inwards, may acquire the deformity of squinting. On a similar account, all objects calculated to attract a baby's attention should be exhibited to it in a front view.

The agitations which infants sustain by the rocking of their cradles are regarded by many matrons and other equally sage observers as having very beneficial effects on their health and comfort. All agitations of this kind, however, must be gentle indeed if they pass not the point at which they are simply harmless. It is no argument in favour of rocking it in a cradle, that a crying child becomes silent immediately on this charming operation being resumed or continued:—the fact only proves that infants are quite susceptible of being trained to bad habits; and, like some of their mothers, can express with a smile their satisfaction when the desires arising out of such habits are gratified. If then, the mildest possible motion in a cradle be at best but harmless, it is not so with those violent agitations which multitudes of idle and unthinking nurses employ habitually with the design of lulling into quietness and silence, children crying aloud perhaps by reason of internal illness or of the torture inflicted by the inadvertent, though not the less cruel, misposition of a pin. Than such a practice, scarcely any thing can be more pernicious:—it is a practice utterly inconsistent with humanity and, of course, in the highest degree.

reprehensible. The stillness that follows it, is seldom a manifestation of true and refreshing sleep:—it is oftener a kind of lethargic oppression induced by an irregular distribution of the blood in the brain. Violent rocking is particularly mischievous during the progress of teething:—its readiest effect then is, to produce convulsive affections which lead to fits of excessive drowsiness, to indigestion and emaciation; and, too often, in spite of the best treatment, terminate in death. Frequent repetition of it, moreover, seldom fails of determining blood in undue proportion to the brain, together with every sort of internal disorder; and, in an especial manner, of originating accumulations of water in the head, with all their most excruciating and deadly accompaniments. Were it, therefore, for no other reason than the prevention of these inconsiderate and fatal doings, the use of cradles should be altogether abolished. As an inducement to their admitting this necessity, it might be well if all mothers, who are partial to the practice of briskly rocking their children for the sake of silencing them, would but for one half-hour only submit to become themselves the objects of such delightful discipline;—and if, after this, they continue to be enamoured of the exercise, it will of course be natural for them to desire imparting the benefits of it to the darlings of their affection.

Such are the adequate and necessarily gentle means which should be employed, under maternal direction, for the purpose of invigorating the tender frame of a babe, during the interval which precedes its attaining the powers that gradually enable it to walk without being supported. The time when this change of circumstances takes place in children is most uncertain:—it has occurred before the usual period of weaning had arrived, and

it has been delayed till near the termination of what is denominated the infantine epoch:—it may indeed be familiar to the experience of many mothers, that some children have walked a few steps without assistance in their seventh month, while others remained incapable of even standing alone, after their third year had commenced. By this simple fact, independently of all others, the instructive lesson is furnished,—that parents should be exclusively guided in putting their young ones to attempt walking, not by *time*, but by the instructive evidences of their *strength*:—these are manifested in a growing impatience of being much confined in the arms and in a disposition, especially when divested of clothes, to climb the mother's breast and neck, to reject assistance at standing, and to exhibit delight on being permitted to creep along the floor upon the hands and knees. So long as their bones, in particular those of the lower limbs, remain soft and easily flexible and, consequently, incapable of rightly sustaining the body's weight, Nature,—that faithful guide whose teachings man is always wise in welcoming,—seems to withhold from them the desire of exercising their as yet unadapted members:—but no sooner have these members been nearly matured to the full performance of their office of upbearing the body, and the brain to the equally important office of balancing it, than the infant displays an increasing dislike of restraint and, notwithstanding its fears and its fallings, renews its endeavours at the independent movements of creeping, standing, walking, running. Let mothers, therefore, be careful of engaging in any premature trials of the young one's locomotive capacity:—by so doing, they shall subject it to the danger of incurring deformity:—let them, however, be solicitous of discerning and merely aiding the progres-

sive development of this capacity, and in this way they will fulfil the requisite duty of promoting its favourable advancement.

Infants, in their very first attempts at walking and ever afterwards, should be carefully guarded from acquiring a habit of placing their limbs and feet, their chest and arms and head, or indeed any part of the person in improper postures, which besides being ungraceful, is obviously calculated to retard or derange those vital actions whereby the progress of organization and the development of vitality are maintained in each individual. While the bones, which constitute the frame whereon all the rest of the body is built, remain immature and soft, they are readily pliable and consequently exposed to be thrown into unnatural shapes, sometimes to undergo absolute distortions, from the contractions of their muscles being irregularly directed. For securing them from such effects, various methods of improving the attitudes and gait of growing children have been contrived; and each of these, perhaps, should be regarded as conducing, in one degree or other, to such interesting purposes. Additionally to those already in use, the practice of training young ones to carry something that is light and bulky, by balancing it on the head, may be recommended on account of its simplicity and its applicableness to the endlessly varying circumstances of society. Whatever contrivance may be employed for this purpose,—a paper, muslin, or silken bag stuffed with cotton, for instance,—it can be made in any form that ingenuity may project or fancy prefer; and, for its right management, nothing more is necessary than its base being not very broad and its height such as to occasion its falling readily, when the body ceases to retain the perpendicular attitude; that it be soft, so as not to

injure the tender surface of the head; that it be so light as not injuriously to compress the joints of the neck and spine; that children begin with learning to support it while standing in an upright but not stiff posture, and subsequently be taught to keep it balanced while walking at various degrees of quickness; and that, at all times, when taking this exercise, they have the head erect and easy, the chest advanced and expanded, the shoulders held back, and the arms, lower limbs, and feet kept in their natural and unconstrained positions.—Let not the simplicity of this mode of training the youthful person, lead to its being despised and rejected;—let it only be subjected to a fair trial, and experience will soon demonstrate its advantages; these are accessible to common observation; they combine the benefits of active and passive exercise; and, it is not the least of them, that this can be made an object of emulation and amusement, as well as an interesting form of elegant and salutary discipline.

Suspended couches constituted an indispensable piece of furniture in the domestic establishments of the Romans in the days of their degeneracy:—they were decorated with gold and the richest stuffs, and adapted in all respects to form luxurious appendages to sensuality. In modern times, they are substituted by some persons for the ordinary cradle, than which they have a more undulatory motion:—in consequence, their action is milder and induces less disturbance of the general system:—and, hence it is believed to possess the power of tranquilizing mental agitation, of soothing pain, and of promoting a disposition to serenity and slumbering. Adult persons, who should be able to appreciate their feelings when subjected to such exercises; and who, by habit, can accustom themselves to find a spurious pleasure in many in-

dulgements, the effects of which are naturally injurious to the unvitiated constitution of man, may practise them as they list without being envied of such enjoyments; but it is quite different with regard to infants:—they cannot intimate whether or otherwise the impressions communicated to them by the gentlest undulations of the cradle or the swinging couch, be acceptable and salutary. This much, however, is unquestionable,—that, in either of these complicated substitutes for a bed, infants are confined to the supine posture, which is the very worst wherein they can be made to undergo exercise;—and, that all such exercises, taken in this position, have a secret but not the less certain tendency, by disbalancing the blood's circulation, to generate slow and insidious diseases in the large bowels, the chest, and the brain.—Let children, therefore, be accustomed, from their earliest infancy, to be put to rest on a smooth, firm but not hard, unmoving couch, with the coverings laid lightly and loosely over them, and they will go to sleep as readily, repose as soundly, and awaken as much refreshed as they possibly can do, when tied and tossed in any of the finest or most artificial contrivances, which the fertile ingenuity of caprice or extravagance shall ever be able to invent.

Swinging forms a kind of passive exercise having something in it which is agreeable to almost every one, whether young or mature in years. Its motions have quite different effects from those produced by the cradle or pendulous bed:—they are modified by these characteristic and essential circumstances,—the person subjected to undergo them sits in an erect posture, and is never so young as to be incapable of expressing a sense of inconvenience or suffering, or of being guided, by new feelings, in limiting the measure of their rapidity and continuance.

In particular temperaments however, or when urged beyond moderation, this exercise appears to have a tendency to induce giddiness, dazzling of the eyes, oppression of breathing, and a peculiar sensation which they, in whom it is excited, most readily recognise but cannot describe. All these symptomatic effects, it is obvious, proceed from an excess of blood being propelled into the parts within the chest and vessels of the brain; and, consequently, do contra-indicate the practice of swinging to those persons who feel themselves thus affected. Nevertheless, to others it proves beneficial, by creating the necessity of constantly maintaining the body equipoised; and, for this purpose, obliging the muscles of the back, shoulders, and arms to sustain frequent and sudden contractions. Many persons, on sailing in vessels of any kind, riding in a springed carriage, or taking amusement on a swing, are apt to be affected with sickness, and sometimes even vomiting:—these symptoms, however, constitute accidents having a purely nervous nature:—they depend exclusively on impressions communicated to the brain and transmitted, by sympathy, from it to the stomach and central organs.

Balancing themselves on a plank, or any long piece of wood, placed on a central support, obtains much among the amusements of children. Except when the ends of the instrument are made alternately to strike the ground, this kind of exercise is not calculated very materially to impress the system. When it is so performed, however, the balancers sustain interchangeable shocks which, according to their force, affect the vital actions. Sometimes for the purpose of accelerating the vibrations of the balance, children strike the ground strongly with their feet and propel themselves upwards:—this gives origin

to smart and frequent contractions and extensions of the muscles of their lower limbs and thereby, in combining the effects of active and passive exercise, exhibits advantages by which the unailing may be profited and the convalescence of such as are sickly advanced.

Riding subjects the body to be influenced by all the motions of the animal by which it is carried:—thus, each time the foot, in advancing, is placed on the ground, it sustains a shock; a repercussion of this follows; the whole body is next agitated; and, in the end, the rider has the whole of his own person proportionately shaken. Now, these communicative concussions may be repeated, to any extent:—that cause, therefore, which acts with a force so great, cannot fail of determining important changes in the vital economy.

The immediate effects of riding have not, of course, always the same degree of intensity:—they are least observable when the animal proceeds at a slow pace, and become more influential as well as more salutary if it goes at a moderate trot. In ambling, the body experiences consecutive balancings, and is shaken alternately from one side to the other, by lively and frequent agitations. Galloping imparts shocks which are perhaps more agreeable to the rider, than those of brisk trotting; but the rapidity of its movement interrupts very considerably the mechanical operations of breathing and, in this way, becomes really injurious when the lungs are feeble or diseased.

The animal's height, and the thickness of its body are circumstances which modify the effects produced by riding:—one that is spirited, slender, and nimble, shakes the body less than a large, thick, and heavy horse which moves with difficulty his sluggish mass and, at every step,

causes the rider to sustain a shock whose influence is very violent and distressing.—When the young are sent to horse-back for exercise and the convalescent for health, they may have the comfort and benefit of such discipline materially enhanced by allowing themselves to be lessened by these natural facts.

From its being regarded as capable of greatly and beneficially affecting the body, riding is usually ranked among the most efficacious of the tonic agents. Besides the advantages obtainable from its influences on the organic constitution and the facility wherewith it can be employed, it enables such persons, as have been so much debilitated as to be incapable of walking, for the purpose of regaining their strength, to proceed into the open fields where they can enjoy fresh air and the beauties of rural nature, without being exposed to undergo the fatigue which lengthened excursions on foot unavoidably induce.

Carriages, according as they are or not suspended on springs, have the intensity of their motions qualified by by these modifications. Persons placed in a cart, for instance, rest on a plain surface: but the wheels of it, as their circumference passes along in successive contact with the ground, are naturally affected by all its inequalities. Each of these occasions a shock being sustained by the vehicle and, through it, a corresponding agitation of those it conveys;—the degree of their force and frequency depends on the softness or hardness, the smoothness or roughness of the ground on which it rolls, and the slowness or rapidity of its course. When the animals drawing it proceed at a slow pace, the consecutive agitations occur at lengthened intervals; but, if they go at great speed, these shocks are frequently repeated, and

their impression on the individuals sustaining them is very sensibly perceived. The amount of motion imparted by the carriage is then exceedingly great, each concussion comes to be reflected in an increasing proportion, and thus inflicts on the persons who are carried, the most violent commotions:—these indeed are sometimes so extensive and so severe as to become altogether insupportable; and, in feeble or nervous people, almost universally excite head-ache, and vomiting, and other equally distressing symptoms.—Exercise of this kind, from the powerful effects it is thus capable of determining, may be successfully employed, under right management, in confirming or restoring health, and in removing or mitigating many complications of disease.

Carriages suspended on springs under whatever form,—and there are many of them,—all exercise nearly the same influence on the actions of life. By means of their peculiar construction, the shocks occasioned by the passage of their wheels over the uneven ground, become converted into equable balancings which are neither inconvenient nor unpleasant:—the column of motion reflected in their progress is interrupted by the re-action of the springs, and instead of receiving their impression all at once, an individual resting in such vehicles is affected by them as it were in detail,—the continuous swing which the body undergoes in them agitates, in the gentlest manner, each of the organic parts whereof it consists. Persons, either young or aged, whose strength has been greatly exhausted by sickness and suffering, whether corporeal or mental; those who, from weakness or nervousness, cannot bear riding on horse-back which requires the trunk being kept in an erect posture, and a degree of muscular energy they do not possess; all they, indeed,

who are so debilitated as to be incapable of taking spontaneous exercise, will find in this kind of carriage a method of subjecting themselves to motion proportionated to their feebleness.

Various complicated machines have been invented by ingenious artists with the benevolent object of subjecting in them, the weak or sickly, to kinds of motion in many respects analogous to what is produced by riding on horse-back or sitting in a carriage which wants, or is furnished with springs. Among these singular and not un-useful contrivances, the *Fauteuil de Poste* of the Abbé Saint-Pierre has been represented as a vehicle so constructed as to impart to those seated in it, every diversity of movement which is usually communicated to travellers passing, in a post-chaise, over an irregular road and at the several degrees of speed practised in ordinary journeys. These resemble exactly the agitations experienced in a cart or springed carriage, and can be made as forcible and as frequent as shall be desirable:—they throw the body from one side to the other, forward and backward, and occasion its undergoing alternate sinkings and risings:—the different concussions may be caused to succeed each other with perfect regularity, or several of them to happen at the same instant:—and, they can also, at pleasure be rendered very impressive or scarcely discernible; recurring at short or protracted intervals; or acting with mildness or violence. Equally conducive to the same purposes, is the *Tabouret* sometimes employed on the continent as an accessible form of domestic exercise. This machine consists of a seat representing the body of a horse, and of an “equipage” of levers so disposed as to support the former, in the shape of four limbs. It is not inconveniently complexed; and, when set in motion, the

rider may sit very much at ease on the back of his ideal charger and procure for himself all the benefits derivable from the equestrian motions of pacing, ambling, trotting, galloping, leaping. This modification of passive exercise is described as having had good effects in maintaining integrity of the vital functions:—it is suitable to the young in wet or stormy weather, to aged and infirm persons, to those who lead a sedentary life, and to such as have been debilitated by chronic diseases accompanied with relaxation of the organic tissues.

Machines of this kind may, doubtless, by means of appropriate processes, produce a perfect imitation of the mechanical actions which riding on horse-back or in carriages communicates to the body:—but, it should never be forgotten that, in all the varieties of artificial exercise, a great part of the impressive circumstances that have place in the natural is wanting. When conveyed into the open fields, in either of these ways, a person finds himself encompassed all around by the recreative air which, by its enlivening qualities, conduces very much towards invigorating the whole animal system; and which, by its incessant agitations, compresses the organic fibres and tends, by such mechanical influence, to promote the development of their characteristic energies:—then, moreover, the body is much more sensible of the impression of the diffusive light that pervades the atmosphere:—and, to all this, may be added the effects which enjoyment of picturesque beauty or grandeur determines on the intellectual constitution and, through the intervention of its agency, on man's material frame. Nothing of this kind takes place while he is undergoing exercise on the different machines which have been invented for such purposes:—he then experiences only the mechanical, the mere

palpable effects of the operation:—the intercommunicating re-actions of his mortal and immortal systems, excited by the sky above and the world around him, are quite unconnected with his artificial conditions:—they depend altogether on the economy of nature.

Sailing in a boat does not occasion the persons in it to sustain shocks or joltings corresponding to the vessel's movements:—to this as a cause, then, are not to be ascribed its effects as a modification of passive exercise:—nevertheless, these are quite unequivocal and readily ascertainable by observation. Aquatic excursions performed in this way, do certainly accelerate the acts of digestion and thereby improve the state of all the essential functions, which consequently give the body strength and the mind fortitude. These happy effects are, in some degree, the result of the exercise itself; but, they may be generally ascribed to the genial impression which the fresh, invigorating, ever-moving atmosphere and the aërial light, universally make on living organization. Under such circumstances, the body perhaps does really experience the communication of an almost imperceptible movement; but, this is probably never so intense as to agitate the system and, by consequence, to consolidate the tissues of its organs and thus advance the development of its vitality. Something of the kind, however, must be admitted as an explanation of the influence of agitative motion in promoting the organic changes which are manifested by individuals who solicit health from sailing in boats on the bosom of undulating waters.

Voyages at sea in ships give rise to important variations in the functions of organs:—they generate a sort of revolution which implicates the whole vital system. Individuals who have not been accustomed to the motions

of a vessel, immediately on being exposed to them, become affected with a particular queasiness, vomiting, giddiness, and general sense of discomfort that is extremely annoying. By the mere act of sailing, therefore, two kinds of influence are furnished:—that derived from the balancings of the body rendered necessary by its following the ship's movements, and from the change then introduced into the course of the blood and into the disposition of the nervous energy, from both of which result the peculiar sensations then experienced:—and that, whose varieties are in some sort external, having their source in the penetrative atmosphere of the ocean acting upon the person by the same mechanical pressure which propels the vessel along the surface of the water. To these may be added the transition to a different climate and the use of different air in respiration, together with the absolutely new order of things wherein the sailer finds himself placed. Here, then, is an assemblage of circumstances, each one of which alone is capable of effecting determinate and perceptible alterations in the animal economy;—and, if such be their power individually, how great and influential must that power be, when proceeding from their united, their correspondent, and simultaneous action? Sea-voyages, for these reasons, have been regarded by many ancient and modern physicians as a powerful medical resource:—they have been prescribed for dropsical effusions, both circumscribed and diffusive; for consumption and other diseases of the chest; for disorders of the digestive organs and of their functions; and for some of the most inveterate nervous affections.—Boys and young men, in all insular and maritime countries, should be inured to what parts of practical navigation are suitable to their years and constitution:—such exercises,

being manifestly natural to them, will contribute in a remarkable manner, to make them hardy and active and enterprizing and generous.

From the preceding exhibition of its nature and properties, it is evident that Exercise, whether active or passive, whether originating from the spontaneous or extrinsic causes of agitative motion, does according to its modifications possess qualities adequate to the production of important effects on the vital functions of mankind. Whatever then be its kind or degree, exercise causes in the fibres of living organs an occult, but perfectly real, movement:—these fibres, in consequence, exert their inherent power of self-constriction and, as it were, creep nearer each other:—next, the living tissues formed by the fibres, have an augmentation of firmness and strength imparted to them:—and, by such a process, the organic systems ultimately derive from this occult or intestine or internal or fibrillary movement, as it has been called, a corresponding increase of their tone and power; and hence, the performance of the functions, each of them is appropriated to execute, becomes freer and proportionately facilitated. When there exists an actual debility or relaxation of the organs and their movements display a profound inertitude, then it is that the true tonic influence of exercise comes to be particularly apparent, and then too is the character of this influence very distinctly manifested. Additionally then to the transient notices already submitted in illustration of these doctrines, there may be usefulness in enumerating, under the form of a recapitulation, the effects communicable by different exercises to the offices of digestion, circulation, respiration, absorption, secretion and exhalation, nutrition, sensation, and locomotion; and, by their subordinate but not the

less admirable agency, to all the manifestations of organization, intelligence, and life.

Digestion forms the result of a very complicated process, to the accomplishment of which the stomach and alimentary canal, extending above it to the mouth and below it to the lower extremity of the bowels, the liver, gall-bladder, pancreas, and other not unimportant organs, all unite in co-operating. Now, exercise imparts simultaneously to each of these parts, degrees of agitative motion, which are incessantly repeated, and thus essentially favours the discharge of the digestive functions. If the stomach be quite empty, exercise rouses the gastric forces, sharpens the appetite, renders hunger more imperious, and prepares the individual for taking a proper supply of nourishment:—but, if the organ be already replenished with foodful substances, the whole digestive system partakes of the excitement and performs the elaboration of nutritious particles with more facility, promptitude, and perfection. Persons having little appetite or incomplete digestion, derive marked benefit from a ride on horse-back or in a carriage, before sitting down to a repast:—such benefits proceed from the influences of passive exercise on the abdominal organs, from the energy and activity communicated to the whole gastric system, by this kind of agitative motion. It is also applicable to the same circumstances, after the taking of meals:—but then, in order to be beneficial, the exercise must be moderate and the mechanical agitations which the system undergoes should not be forcible or have any thing in them calculated to occasion disturbance of the assimilative functions. Let it be remarked, however, that the effects of active exercise on the processes of digestion are singularly different from those of the passive:—running or

dancing, immediately after an individual has taken food, subjects the stomach to violent concussions that are capable of altering the natural order of its movements, and moreover distracts from it the vital powers by directing them in a disproportionate degree to the muscles of the limbs, and thereby interrupts the digestive actions. Gentle exercise, as a slow walk, on the contrary, promotes this function:—and, as it neither requires great muscular exertion nor tends to dissipate the organic forces, it invigorates the stomach and thus forwards all the stages of aliméntation. It exerts, moreover, a particular influence on the liver, and thus facilitates the secretion and distribution of the bile, supports the peristaltic actions of the bowels, causes the chyle to flow regularly into the cavity of the alvine passages, and enables the lymphatic vessels readily to suck in the chylous atoms naturally submitted to their action.

Circulation of the blood, in like manner, comes to be affected by the exercisings which the animal frame may, for health or recreation, be made to undergo. The aggregate of vessels that convey the blood from the heart to all parts of the system and those which carry it back again from these parts to the heart, receives each its own share of the agitative impressions communicated by exercise to the living body:—the heart, which is the well-spring of the circulating fluids, in particular experiences very sensibly the effects thus determined. What mechanical shocks are then felt by the whole circulating system, impart more energy to its action and concur very powerfully in maintaining regularity in the course, both venous and arterial, of the sanguineous fluid. When a person goes to ride on horseback or in a carriage, the pulse forthwith begins to be, and remains contracted:—soon, how-

ever, as he discontinues taking this exercise, its vibrations immediately become stronger. This contraction of the pulses arises from the column of blood being impelled with augmented vigour into the arteries, while the structure of these vessels attains an increase of resistant power and their tone is, at the same time, remarkably developed:—then, indeed, the individual feels, as it were, a greater amount of energy pervading all his circulative functions.

Passive exercise, however, affects only the inherent vigour of the sanguiferous organs:—it seldom excites more frequent or more rapid contractions of the heart:—neither does it necessarily accelerate the pulsations of arteries:—it imparts to them more strength and thereby tends to restore their regularity when deviating from the ordinary tenour. This remarkable fact explains the cause that, in some instances, occasions a sudden and perceptible remission of the pulse's activity. Many persons having the primary symptoms of consumption, undergo this singular change and, by experience, are taught to procure benefit from practising the mode of exercise whereby it is induced. It exhibits a most instructive practical lesson which the medical inquirer should always be solicitous of employing as a guide in circumstances wherein its application may promise being followed by profitable results. Similar advantages, also, have been derived from a prudent and rightly regulated employment of the swing. In conditions exactly similar, however, many individuals sustain a very marked quickening of their pulses:—this particularity is owing to an excessive irritability of the heart and an extreme debility of the whole living system. Appropriate exercise, by reviving the natural energies of all the organs and re-animating the inherent vigour of the

saugineous, contributes essentially, in such cases, towards recalling the movements of the heart and arteries to a more equal tenour:—the reason of this is,—proportionally as the morbid frequency of the pulse diminishes, it then experiences a sensible abatement of its intensity. When a person, afflicted with violent palpitations of the heart, obtains relief from the agitative motions of a carriage, an influence analogous to the former is the cause of this amelioration:—the intermissive shakings imparted, by these motions, to the central organ of the circulation, promote the development of its tone, re-establish its native actions, and thus arrest the progress of a train of symptoms depending entirely on a momentary alteration of its vitality.

Circulation of the fluids which permeate the capillary tubes is also susceptible of being impressed by the same agency; but their influences are confined to the preservation of the natural regularity, without increasing the positive activity, of these vessels:—this peculiarity manifests the difference that exists between the influential powers of the passive and spontaneous kinds of exercise. The latter always accelerates the course of the blood in the minute vessels, and occasions a distinct development of animal heat:—the former never produces this result, never gives rise to the disengagement of caloric, beyond a moderate or salutary extent. Travellers, suffering from cold in winter, dismount from their horses or leave their carriages; and, for the purpose of regaining a comfortable degree of warmth, commence walking or even running. Contractions of the muscles of their extremities thus induced, in a short time, produce a more accelerated motion of the whole mass of blood, and the balance of animal heat is restored. Running gives rise

to frequency of the pulse, to redness and heat of the skin, and to excessive perspiration:—riding unless when inordinately rapid, seldom affects the existing rhythm of the pulse or elevates the rider's personal temperature.

Respiration has a ready susceptibility of being affected by the influences of exercise on the organs which execute this important function. That which is passive, by invigorating the textures of the lungs, qualifies them better for maintaining the uniform discharge of their offices:—it does not occasion undue frequency of the alternating processes of inspiration and expiration; neither does it, by accelerating the blood's course through the sanguiferous vessels, cause this fluid's returning to the lungs or being subjected too often to the action of atmospheric air in the pulmonary cells:—hence, it is apparent,—that this kind of exercise cannot be calculated to produce too great activity in the chemical coalescences of respiration,—and that, it does not cause the blood's attaining an excess of its animative qualities. When carried beyond a due measure, as in galloping on horse-back, or being driven with excessive velocity in a carriage, or taking amusement in the swing to an inordinate extent, it doubtless will in some instances, bring on difficulty of breathing and a distressing sense of confinement in the chest; but, all these effects are purely owing to a momentary spasm of the expansive tissues of the lungs, and do not otherwise implicate the mechanical movements of respiration. By the active exercises, however, the mechanical movements of this function are inordinately quickened:—they lead the acts of inspiration and expiration to succeed each other with greater rapidity and, consequently, to be more numerous:—in the same way, they give rise to the fresh air's entering much oftener into the recesses of the

lungs:—and, hence it comes, that all these circumstances do most materially influence the process of changing venous into arterial blood. Muscular action, moreover, stimulates the heart, hurries the pulmonary circulation, and conduces thereby to render unnaturally active the chemical offices of respiration:—it, also, puts the general economy into a state of excitation, exalts the vital properties of all the organic systems, and leads to an excessive consumption of the vivifying air:—then, likewise, the mass of blood acquires a more animative, more vital nature:—the fluid, which the arteries diffuse through every texture, is more oxygenated, more life-giving:—and, hence, it comes that these new qualities of the arterial blood and the influence they have on the muscles, assist essentially in the conservation of the muscular excitability when, by strong and frequent contractions, it is weakened and sometimes brought to the verge of being altogether extinguished.

Absorption has its activity maintained or augmented through the intervention of the influences of exercise on the general system:—by it, the energies of the lymphatic vessels, internal as well as superficial, which absorb the nutritious particles of food and the fluids or other substances naturally submitted to their action, are effectively enlivened. Persons, whose employments oblige them to make great muscular exertions, rarely become corpulent:—the vivacity of their absorbing organs prevents the deposition of that matter, on whose accumulation the progress of obesity depends. In all such individuals, the substance of their organization has much firmness:—throughout their structure, the fibrous are greatly predominant over its fluid elements. Luxury and inaction are favourable to the development of animal fatness:—la-

hour and motion, by regulating absorption, render the body firm and athletic and vigorous.

Secretion and exhalation form a counterpart to absorption. Proper exercise qualifies these vital processes to maintain their measure of activity which conduces most to health:—it enables the body through the instrumentality of the secreting and exhaling vessels, to part with what of itself has ceased to be useful, and thus establishes a constant equipoise in the animal economy:—and, it also assists the system, by the same means, to regain this equipoise when interrupted by the encroachments or depredations of whatever may be a cause of disease.

Nutrition may be remarkably promoted by right modification of the effects which exercise communicates to all the living tissues. Its mechanical impulses, by advancing the development of tone in these tissues, by universally animating their vitality, give a continuous activity to the essential acts of assimilation:—and this, again, imparts to each organ the material elements necessary to repair the losses it sustains, or to regenerate its intrinsic nature when that has been deteriorated. Experience and observation prove, that individuals who habituate themselves to travelling on horse-back or in carriages, find this practice exceedingly favourable to the process of sanguification. Such persons have always an ardent temperament, their countenance is generally florid; and, without attentive management of their habits and a suitable regulation of these exercises, become predisposed to active hemorrhages and inflammatory affections:—in them, also, the blood, relatively to the other parts, exhibits very evident appearances of being superabundant. Local nutrition, which makes and maintains the substances that compose the animal machine, is equally well forwarded

by a discriminating employment of the passive exercises. Thus assisted, all the organic structures become thicker, firmer, and more resistant:—they acquire, at the same time, an increase of material force and an exaltation of vital energy.

Sensations are experienced by animals through the intervention of the brain and nervous system:—exercise, by its tonic influence, opposes the irregular actions of these organs, corrects their irritability when excessive, and procures manifest advantage in the treatment of spasmodic affections. It acts indeed on all the organs of the senses:—it arouses their vitality, and makes them more susceptible of external impressions. Its effects on the moral and intellectual faculties are too variable and uncertain to be appreciated:—nevertheless, agitative motion, when duly attemperated, appears to animate the brain, to augment its inherent energies, to render its perceptions more lively, and to favour all the operations of intelligence. Passive exercise, in particular, by leaving the muscles in a state of rest, does not impel the vital forces towards the extreme members; but, by influencing the brain, contributes directly to its obtaining renovated powers and fresh activity. When the mind can be held with-drawn from resting on surrounding objects, riding in carriages or on horse-back, in the open air, disposes it to reflection and contemplation. This kind of exercise has other moral effects:—persons afflicted with real or imaginary maladies experience, when enabled by such means to expatiate amid the beauties of rural nature, a satisfaction which to their feelings is altogether exquisite:—the pure and exhilarating air they respire, and the fairness and freshness and diversity of the scenes incessantly represented to their observation, all unite in banishing mel-

ancholy, in fascinating the imagination, and in awakening true sentiments of contentment and gratitude and benevolence and charity in the heart.

Locomotion forms one of the distinctive functions of animated beings, and muscles whose operations are subject to the will, constitute the principal agents by which it is executed. Active exercise cannot have place without these organs performing vigorous and repeated contractions:—that which is passive, however, does not require their making lively efforts:—it leaves the muscular tissues in a state of quietude; but these, like all the other parts, sustain shocks and agitations, each time the body is subjected to such movements:—and these agitations have the effect of developing the muscular sensibility. When a person rides at a rough trot, especially if he has not been accustomed to riding, he suffers very distressing pains in the loins, back, and shoulders; and these parts even become acutely sensitive to the touch:—in such cases, it appears as if the multiplied concussions they experience do, as it were, contuse the fibres that form the muscles so affected. Motion of these organs, then, does conduce to the ampliating their vital properties, attracts an abundance of blood to pervade their tissues and, in particular, renders them more energetic in the assimilation of fibrine. Artizans, whose arms are subjected to almost incessant motion and exertion, have these members very brawny and powerful. The flesh of domestic fowls, that are left to live at liberty and keep themselves in unceasing movement, is firm and dry and tough; whereas that of poultry confined in coops, has always a peculiar whiteness and tenderness and delicacy. The former have their muscular fibres compact, numerous, and condensated:—on the contrary, they are thin and separated by profu-

sion of cellular texture, in animals retained in a state of imprisonment and inaction. Their bones also present an extreme dissimilarity of internal composition:—in those that range at large in the enjoyment of natural freedom, these are firm and solid, and contain much calcareous matter;—encaged poultry have them very slight and easily broken.

Exercise,—as the scope of these observations would intimate,—constitutes a natural source of those forms of motion whose rightly discriminated applications can be made available in the endless circumstances of Man,—during his infancy and childhood, in the prime of his days, and when old-age begins admonishing him, by its failings and its infirmities, that this world cannot be his permanent dwelling-place.

Nature employs all her energies and resources, during infancy and youth, in perfecting the development of the animal machine. At this time, her operations may be assisted by the exciting influences of motion:—then, too, the nutritive functions require being kept in a state of continuous activity:—and, exercise forms the best and the surest means by which this can be originated and maintained. Hence it is, that the desire of motion, in children seems insatiable:—it is prompted by their instinctive perception of its naturally conducing to their general well-being and to the progressive advancement of their growth:—and hence, their propensity to be perpetually changing their positions, to be incessantly running, leaping, dancing:—all which, their fitfulness and impulse to action, arises from excess of the contractility and vitality of their locomotive muscles. Motion is indispensable to the body's consecutive enlargements, and the agents which afford and execute this motion have, during these

interesting processes, a superabundance of life, that always urges, in young people, the inclination to be moving their members:—repose to them is then a constraint, absolutely a punishment. On the one hand, the muscular organs solicit, as it were, to be put into action, as if for the purpose of expending the redundance of vitality they possess:—on the other, the motions which result from their being thus occupied, promote the designs of nature and fulfil her maternal intentions. Muscular exercises are peculiarly favourable to the circumstances of young persons, at the time they are passing from the state of childhood:—they operate kindly in regulating the important change which is then preparing for the animal economy, and enable it to acquire new conditions, new degrees of aptitude. Exercise, if moderate, is beneficial to the young:—when excessive, it proves insalutary. This is exemplified in the children of the poor, who are early doomed to undergo hardship and hard labour:—consequently, these unfortunates are diminutive in stature and delicate in constitution, and soon exhibit all the manifestations of premature old age. It is quite evident, however, that these appearances are the effects, not of rational exercise, but of muscular exertion pushed beyond what nature requires, or what nature can endure. Nevertheless, such facts are fraught with instruction:—they should lesson parents in the duty of preventing their children from addicting themselves to exercises that are immoderate or violent or too often renewed.

Adult persons no longer require to employ exercise for the chief purpose of favouring the body's growth, by imparting more activity to the functions of assimilation and digestion; but it eminently contributes to the maintaining of a degree of regularity in these functions which

invigorates the health, prevents diseases, and retards the infirmities of old-age. Men who lead sedentary lives, ought to devote a portion of each day to walking or other gentle exercise:—women might secure themselves from the sufferings inflicted on them by many nervous and other painful affections, by adopting the same precautions:—even the most aged may derive great benefit from a right use of muscular exertion:—it will re-animate the waning energies of their organs, and dissipate or partially ward off the sinking and atony with which they come to be incessantly annoyed, Let old men, however, remember that their accustomed modes of exercising themselves should never be changed in their declining days:—experience has perceived, from the first ages, that habitual exercises exhaust the body less than any new kind of corporeal motion to which it has not been inured.

Exercise, in fine, can be made subservient in a multiplicity of ways,—whether guided by the promptings of instinct or the reasonings of intelligence,—to the exact development of animal organization, to the requisite balancing of the human constitution, to the preservation and improvement of man's health, and to the modes of mitigating or removing the diseases of his body and the maladies of his mind:—growing persons require it, grown persons want it, declining persons need it; let proper exercise, therefore, be employed by all men, almost at all times, and in nearly all circumstances. Exercise is Nature's favourite assistant, the true healer whose powers, aided by those of temperance, are quite capable of restoring the little aberrations of well-being that may incidently occur in those who regulate their moral economy by the simplicity of nature's laws:—medicine, though naturally the most benevolent and serviceable of the sick

one's artificial helpers, does by much too frequently, suffer the degradation of being made the slave of luxury and fashion; and, as such, has become indispensable to the self-created cravings of the degenerate and the unwise. Let, therefore, the universal truth be indelibly engraven on the judgment of parents; let them only believe it and adopt the practices it should induce them to prefer, and they will find, to their delighted experience,—that when duly modified, exercise and temperance, with the very rare help of medicine, are to the prevention of many infantile diseases as well as to the right “MANAGEMENT OF CHILDREN IN HEALTH,” nearly, if not altogether omnipotent.

END OF PART I.

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PART II.

ON THE

MANAGEMENT OF CHILDREN

IN DISEASE.



ON THE

MANAGEMENT OF CHILDREN

IN DISEASE.

PREPARATIVELY to the better understanding of what shall be advanced in regard to the "MANAGEMENT OF CHILDREN IN DISEASE," there may be propriety in premising some cursory remarks, having as their object an illustration of the effects attributable to the chief curative agents usually administered for the prevention, mitigation, or removal of those maladies with which young persons, from their particular circumstances, are liable to be afflicted.—Remedies then, according to the general mode of their exhibition, admit of being conveniently distributed into a twofold classification,—the external and the internal:—among others of the former kind requiring notice,—besides the light, air, and dress, whose influences on life and health have already been considered,—are sleep, water, lavements, and medicaments strictly so called:—the latter comprehends all the diversified modifications of medicine.

Sleep holds that relation to the vital, what Nutrition does to the organic constitution of animals:—the latter contributes to the increase of their growth and the support of their strength; the former to the maintenance and

renovation of their spiritual energies. Like almost all their wants and many of their functions, it is characterised by periodical returns, having their dependence on a general law of nature. Independently of this peculiar circumstance, however, the inclination to sleep is directly promoted,—by the application of fresh air; by monotonous sounds; by silence and darkness; lassitude of the system however induced; warm bathing, cooling drinks, fermented liquors, narcotic substances, excessive cold; moderate exhaustion resulting from mental or corporeal exertion, and having effect rather on the organs of action than on the intrinsic forces of the nervous system; in a word, by every thing that conduces to diminish the person's impressionability, to weaken the re-actions of the brain on the living parts which execute functions only in subserviency to its influences.

Night is the time appointed by nature for sleep:... nevertheless, individuals who are subjected to hard labour, those that have become infirm or enfeebled, and those whose temperament is highly nervous, require the refreshment of a short sleep at noon or after taking food, especially in hot countries or in the warm season of temperate regions. Infants, females, men of studious habits, all such indeed as are made to undergo great fatigue, or remain depressed by their engagements or by weakness, need longer repose in bed than others. Every person who is full-grown and healthy should have, at least, five or six hours sleep for each day; but ought never to indulge in more than eight or nine. It is unwholesome for any one to rest in low, damp, ill-aired apartments; but to children and the young, whose lungs are tender and their absorbing vessels active, it is particularly pernicious.

Sleep, during the concomitant repose of the senses and

organs of voluntary motion, renews their exhausted excitability and, by this means, restores their activity and vigour. When regular, undisturbed, and moderate, it proves most beneficial to the health:—by it, the muscles are strengthened, and their contractions made more prompt and powerful:—the mind, at the same time, is more acute and the judgment clearer. Protracted wakefulness induces a great degree of debility and lassitude in the intellectual faculties as well as the locomotive organs; but their repose, during sleep, regenerates their inherent forces and restores to their action all its energy. Disagreeable dreams, by interrupting the due tenour of sleep, deprive it of its salutary influences and give it a tendency to aggravate the general depression which the body may be enduring. It is not, however, in a direct manner, that sleep invigorates the system:—when sleeping, the exhausted organs recover all their vigour, because they are then in a state of inaction, and because during that state of inaction, the digestive processes continue to be vigorously performed. Except what escapes in the fluids of perspiration, the body does not then part with any portion of its elementary substances; it lives as it were for itself alone; it remains a stranger to every thing by which it is surrounded.

Without regularly enjoying sleep, man cannot long exist, for his brain, his senses, and his muscles do not, like the organs whose functions are essential to the integrity of his material nature, enjoy the inexplicable privilege of being indefatigable:—sleep, therefore, is a condition indispensable to the prolongation of life. For the purpose of rightly ascertaining its effects during health, let the state of the functions in the animal economy, at the moment when a person awakes, be compared with what

their condition was at the time when drowsiness began overpowering his sensations and consciousness. In the first of these conditions, several of the functions are manifestly enfeebled; particular organs, from their actions having been in an immoderate degree continued, sustain exhaustion of their energies:—thus, the muscles of the pedestrian traveller, who has made a long journey and undergone great fatigue during the day, cease to obey the power of volition and with difficulty execute the requisite contractions; but, after a night's tranquil rest, regain all their agility and their powers. Like the muscles, the organs of the senses and those through which the manifestations of intelligence are exhibited, all owe to the invigorating and balmy influences of sleep, the restoration of their natural energy:—this effect, in some of these organs, is remarkably distinct; in others, though less apparent, it has an existence as real and as appreciable by the individuals who experience a change so favourable to their welfare and strength.

Sleep, of itself, produces good effects in a great number of diseases. When calm, and moderate in duration, it is generally found beneficial to persons suffering from pectoral and abdominal inflammations:—it always proves serviceable in affections whose chief symptom is intense pain, in many that are convulsive or spasmodic, and in very many that are nervous; and, when properly managed, contributes much to their removal and the re-establishment of health. Insomnolency increases the energy of morbid action; it is prone to excite feverishness, and consequently should never be allowed to escape observation:—sleep, on the contrary, especially when natural, has a decided and salutary influence in preventing its aggravation or causing it to subside. After all surgical

operations, particularly such as have been tedious and excruciating, the patients often sleep long and profoundly; and, by this means, have their sinking forces revived. It is, therefore, a rational indication, that under all such circumstances a state of rest and repose be if possible induced; and this result will be always preferable, when it proceeds, not from artificial resources, but from silence, darkness, quiet, fresh air, sponging the body with warm or cool water, or from any other of the natural causes of sleep. This, when serene and peaceful, seldom fails of allaying moral and physical excitement, and of restoring to the mind its native firmness and tranquillity. When calm and regular and light, its effects are salutary:—they moderate the intenseness of irritation and allow the hope of a disease's termination being favourable; but, when agitated and unrestful, they exhaust instead of recruiting the forces:—the state then becomes one of continuous somnolency, a perfect and, of course a fatal lethargy.

While its foetal state continues, the new being has a kind of existence which is purely vegetative, and none of the functions of relative or external life require then to be exercised by its unborn and immature organs. It sleeps incessantly, or rather rests in a kind of profound torpitude;—only, during several weeks previously to its approaching birth, it performs certain instinctive or mechanical motions, resembling those made by sleeping persons, for the purpose of changing a position that has become irksome to their sensitive feelings. Hence, when its infancy commences, the young one exhibits great feebleness and imperfection of the muscular and osseous systems, and of the external senses, while nutrition, material assimilation, and all the organizing functions proceed with admirable energy and promptitude, and maintain a decided

preponderance throughout all the systems of the living machine:—many of the first days of its existence are occupied solely with sucking and sleeping:—the younger it is, or the better it is nourished and the larger it grows, it sleeps proportionately the more:—nature appears then to employ her chief energies in promoting its gradual formations and growth. Excess of sleep predisposes men and animals to corpulency, especially when they have a propensity to slumbering after partaking liberally of their food:—old persons however, except when diseased seldom sleep soundly; it is the same with them who have their digestion slow or imperfect. Too much sleeping in like manner renders children heavy, bulky, inanimate; too little prevents their acquiring strength, and the progress of their enlargements:—in the first instance, their external or sensitive functions remain defective; in the second, their internal or nutrient are detrimentally feeble. Frequent yielding to the powers of drowsiness, increases the disposition to it, and creates an absolute exigency for its being indulged:—the habit of long watching has the effect of enervating the whole system, and of gradually inducing a state of fatal insomnolency:—it is, therefore, in all respects recommendable that children be trained to the salutary practice of keeping themselves awake during the day and sleeping in the night, of going soon to bed and rising betimes in the morning:—but, in early infancy, it is indispensable to the young one's welfare, that it be much accustomed to enjoy the invigorating tranquillity of repose.

When rightly tended and kept healthy by being suckled after the manner natural to their condition, infants go to sleep readily and their inclination to it experiences regular returns:—they do not, therefore, stand in need of

rocking in cradles, nor require having themselves subjected to any artificial tumblings whatever, for the purpose of being lulled into a state of quietude and sleep. Let them only have proper nourishment; and they will not suffer those gripings and other internal pains which so often keep them from sleeping:—let them not be girded with swaddling-clothes nor pinioned in rocking couches; and they will seldom experience that constraint of their members or those irksome and baneful compressions which fatigue and incessantly arouse the sensibility of their organs:—let them be preserved from the effects of their soiled and wet clothes which excoriate the tender surfaces of their tender persons:—let these simple and self-evident precautions only be employed, and nurses, even the most negligent, will be convinced that their charges do not need cradling or rocking or tossing of any kind for promoting in them that inclination to slumbering which is so advantageous to them in health, and conduces so much to their recovery from disease. Fretful and impatient nurses have two never-failing methods of compelling babies to sleep or at least to be silent. Both of them however are bad, each of them is absolutely execrable:—that of violent rocking them in the cradle,* as

* Adult persons, when rocked in a cradle for a short time with considerable briskness, successively experience sickness, ringing in the ears, giddiness, head-ache, and vomiting. More than one instance is known wherein this operation, the result of an indiscreet frolic, induced in people of ripe years a lethargic state which ended in a brain-fever and frenzy, and long resisted with the greatest obstinacy the powers of an energetic and appropriate treatment. When mothers, therefore, shall take the trouble of recollecting,—for the fact cannot be disputed,—that the brain in grown individuals is much firmer and consequently less susceptible of being

has already been said, disturbs their digestion, predisposes them to reject their food, deranges the sanguineous circulation, induces a degree of congestion in the blood-vessels of the brain, and thus determines a morbid somnolency which, especially in children having large heads, becomes very often the forerunner of the most unmanageable and destructive maladies:—and that of giving them wine, brandy, gin, or whisky in sweetened water, and similar ill-concealed but insidious poisons, or laudanum, syrup of poppies, and other preparations of opium, exercises the most pernicious influence on their nervous system; and, as happens with the brutalized orientals who abuse these beneficent boons of nature, renders them dull and heavy and melancholy, or peevish and irritable and irascible, and of course unhealthy and unhappy through life. Such wicked and relentless practices are employed to an extent at which every feeling of humanity is utterly abhorrent:—sometimes, they have the concurrence of stupid or infatuated mothers; but far more frequently proceed from the clandestine machinations of

affected by mechanical impressions than in infants and children, they will not require an uncommon share of discernment to perceive how what produces such effects on mature organization, must necessarily be calculated to inflict incalculable and irretrievable mischief on that which is yet tender and has not attained its ultimate completions. It cannot then be saying too much, to aver that multitudes of children, especially in the inferior classes of society, are led to perish at a premature age, by diseases having their first origin in the rough rockings employed by their nurses with the ignorant and mistaken view of promoting what in them should have been the natural inclination to sleep. Many facts furnish evidence legitimately authorising this induction which must, moreover, be consistent with the experience of every one who has made this interesting matter the subject of observation.

hireling nurses and the attendants on females in confinement. In this way and for the criminal purpose of securing to themselves the undisturbed indulgence of sloth and sleepiness, these unprincipled persons hesitate not to endanger the health and even the life of many a helpless innocent. This is no exaggerated picture; and if parents shall only admit the possibility of its having place in society, they will soon find it to be actual and true:—there cannot be injustice, then, in their exercising a circumspect and unrenmitting watchfulness lest their young ones be brought to suffer from the effects of these perfidious doings. Honest nurses will not be offended by such suspicions when they have their source in the purest parental care and affection:—the base and the guileful alone shall thus be made to apprehend the danger of exposure and punishment.—Let these remarks, then, these earnest and faithful remonstrances, be understood as having for their sole aim,—to exhibit the disadvantages of artificial, and the advantages of natural sleep,—and to represent to the minds of parents how positively necessary it is, that they endeavour with unwearying solicitude to secure it for their young ones in due proportion and by determinate intermissions.

Water, if it could be obtained quite pure, would be perfectly transparent, without odour, and tasteless:—it is endowed with many properties which make it valuable both for economical and medical use. This fluid also exhibits many characteristic varieties; all which, however, may be comprehended under two general heads,—the spring and atmospheric water. What issues from springs is distinguished by having soft, or hard, or saline, or mineral qualities:—when soft, it readily dissolves soap and is most generally useful; what is hard holds earthy salts

in solution and decomposes soap; the saline is more or less impregnated with soluble salts; and the mineral waters are distinguished by their temperature being higher or lower than that of the atmosphere, and by their including medicinal substances in proportions so considerable as to exert a particular action on the animal economy,—they are either alkaline, calcareous, carbonated, chalybeate, purgative, or sulphureous. Atmospheric water consists of melted snow and the rain:—that collected in the open fields, by remaining uncontaminated with the emanations of decomposed animal and vegetable substances, or with the smoky particles and other aërial impurities which load the atmosphere of large towns, constitutes the purest natural water:—its softness renders it applicable to a multitude of domestic purposes; and it is salubrious, in being nearly exempted from every kind of extraneous admixture.

When externally applied, the influences of water depend almost entirely on its temperature, which may be cold, tepid, warm, hot, or in a state of vapour.

Cold water applied to the surface of human bodies has the general effect of facilitating the passage of free animal heat; and, by such means, induces the sensation of coolness. Its particular action, however, is manifold, and at the same time susceptible of modification by the existing condition of the system, the degree of its own intensity, and the measure of its duration. Its primary influence is stimulating, and the exaltation of sensibility caused by it, bears a proportion to the lowness of its temperature:—next, it produces constriction and condensation of the living fibre, and thus acts as a tonic both to the organic and vital constitutions:—and, in the end, it proves a true sedative, by abstracting the excitement of heat, and pre-

venting that distribution of blood in the superficial vessels on which and the nerves the power of repelling and admitting impressions intrinsically depends. When employed in the form of sponging the person over all parts that are readily accessible, its effects are mild and agreeable and moderate:—sponging them with tepid or cool or cold water really constitutes, on many occasions, a perfect luxury to the sick, and must be regarded as a medicinal application at once grateful and salutary. Pouring cold water suddenly on particular regions or over all the body, is another method of communicating its beneficial efficacy in those cases where such is indicated. Its operation, in this way, is instantaneous and momentary; but, by repeated affusions, may be so managed as to procure the requisite determinations. But the pure cold bath itself exercises the strongest and most remarkable influences on almost every organ and on nearly every function of the animated machine. Immersion in it, at first, induces a feeling of coldness having an intensity corresponding to the water's temperature:—this gradually subsides and a sense of numbness supervenes:—the skin becomes bloodless, rough, and constricted; shivering succeeds; the solid parts are condensed and the diameter of vessels lessened; the visible superficial veins grow smaller so as sometimes to disappear, and the fluids suffer a diminution of volume, giving rise to paleness and oppression of sensibility:—quickness and irregularity of breathing ensue:—and the pulses are slow and concentrated, but firm and uniform. Sometimes, there is a sense of drowsiness and inactivity; the joints lose nearly all their flexibility; and the limbs are affected with pains and spasmodic contractions. Primarily, the internal heat is considerably reduced, but by degrees regains its natural

standard:—nevertheless, the extremities may remain cold and benumbed, or swell and assume a livid colour:—the perspiration also is suppressed and, in many instances, the discharge of urine gets to be frequent and copious. On emerging from the water, if its application has not been excessively prolonged, an agreeable sensation of warmth pervades his whole frame and the bather feels refreshed and invigorated:—but, if his immersion has been continued to an immoderate extent, long and very violent paroxysms of shivering arise; the pulses gradually disappear; the heart's motion becomes feeble and languid; coldness and faintness at the stomach are felt; the animal heat rapidly diminishes; and, unless prevented by energetic antidotes, the worst consequences ensue.

By this description of its nature and agency, the mind is naturally led to recognise, in the right application of cold water, an invaluable and powerful remedy for many of the morbid conditions incidental to mankind. When the body's heat is steadily above the standard indicative of health, this fluid may be advantageously employed, by sponging, affusion, or general bathing, in the treatment of fevers and febrile paroxysms, and in many diseases arising from relaxation and debility. Much advantage may be obtained from the free employment of it in those forms of fever wherein the degree of animal heat is excessive:—it has often proved remarkably useful in textural and organic inflammations, both internal and external, concentrated or diffusive:—and its effects are decidedly beneficial in all kinds of hæmorrhagy; in sprains, contusions, and burns; in locked jaw and acute rheumatism; in cholera and other modifications of dysentery; and in the hysterical, maniacal, and many exanthematous diseases.—Persons having an irritable or constitutionally

nervous habit, and all they who experience inordinate distress from the application of cold water, should secure themselves from the violence of its action, by using a robe of fine flannel or other thin texture. Under any mode of exhibition, its effects are injurious when sustained soon after taking food, when the body is bedewed however slightly with perspiration, and while its temperature remains under 97° of Fahrenheit's thermometer. If ever employed by those who have the plethoric habit, this ought to be done with the greatest caution.

Tepid, warm, and hot water, all determine effects on living organization, that are nearly similar in their nature, but different in their degree:—this depends altogether on the elevation of the fluid's temperature. The tepid has influences intermediate to those of the warm and cool; but bathing in warm water, particularly if the arteries are throbbing with preternatural activity, reduces the pulse's frequency, and this diminution of velocity in the blood's course is generally proportioned to the length of time the person has been submitted to immersion. By it also the acts of respiration are rendered slower, and the temperature of the body lessened:—it increases the bulk of the fluids by favouring the absorption of watery particles, produces relaxation of the muscular fibre, removes impurities from the surface, promotes the desquamation and renewal of the cuticle, and softens indurations of the skin.

Affusion of warm water induces little alteration of the vital actions, and its effects are very transitory:—nevertheless, it has peculiar though mild influences which may be employed, both with comfort and advantage, against the exacerbations of hectic fever, and in such morbid conditions as are characterised in chief by accelerated or la-

horious breathing, or by the excitement of preternatural heat:—it tends to moderate all these symptoms, creates a genial langour, and promotes the inclination to sleep.

Deeper, though still inconsiderable, impressions are communicated to the system by the warm bath:—it proves injurious in all cases of difficult respiration, when there is congestion of an internal organ, and if the stomach contains much food:—but, on the other hand, it frequently acts beneficially in febrile affections, eruptive inflammations, and in many of those cutaneous disorders that arise from badness of the constitution.

Water heated about 97° of Fahrenheit's thermometer has a powerfully stimulating action on the vital circumstances of animals:—it accelerates the arterial pulsations and the alternating motions of the lungs; reddens all the cutaneous surface and excites flushings of the countenance; makes the veins turgid; produces sweating; and raises the temperature of the body's native heat:—its effects, in excess, are alarming and dangerous; they determine an extreme activity of the blood-vessels, a sense of anxiety and oppression and suffocation, painful throbbing within the head, giddiness, swooning, and apoplexy.

Vapour-baths, from water alone or medicated with sulphur or mercury, have for their immediate effects, an increase of velocity in the circulating fluids, and its natural result, profuse perspiration. By the continental physicians who have had most experience of their efficacy, they are regarded as being endowed with power,—to stimulate the cutaneous system and thereby restore or augment the perspiration; to soften the textures of the skin and relax parts that may be affected with inflammation; to assist in curing herpetic and scabious diseases; to promote the exanthematous eruptions; to drive gouty and

other morbid humours from important organs to those that are less essential to life; to allay inordinate sensibility of the nervous system; to promote the healing of chronic ulcers; to cause the re-absorption of lymph arrested in the lymphatic glands, and in the cellular tissues of the joints; to renew the action and lost tone of the mucous membranes; and to revive the energies of muscles, and of the digestive organs.

Mineral waters, whether cold or heated, do not appear to produce very peculiar effects when applied to the surfaces of living bodies. Their internal use, however, exercises a specific action which depends much on the nature and properties of the substances each kind of them holds in solution, and on the great diluteness of the mineral particles wherewith the liquid may be impregnated:—this last circumstance, moreover, increases their activity by making them more susceptible of being inhaled by the assimilating vessels. Alkaline waters are not very grateful to the taste; but their action on the system is tonic and invigorating:—for morbid acidity of the stomach and diseases characterised by irregularity of the fluid dejections, they have often been drank with decided advantage. Carbonated springs, when strongly imbued with the gaseous acid which distinguishes them from all others, have a sparkling appearance and an agreeable degree of pungency:—they are stimulating and even capable of inducing slight, but transient, intoxication:—and they relieve bilious complaints; are useful in sickness and atony of the stomach; sometimes check the tendency to vomiting; and afford benefit in fevers of the typhoid type. From their having neutral salts in their composition, the chalybeate waters act as gentle laxatives; but their more ordinary influence is that of exciting the system and ac-

celerating the circulation:—they may be taken with advantage in every case where the constitution is suffering from exhausting discharges, or other cause of emaciation or debility; and in all kinds of nervousness and the spasmodic affections. Neutral salts also constitute the active elements of the purgative springs:—they should be used for a considerable time, and in proportions so managed as moderately to prompt the natural actions of the bowels:—in this way, they do not weaken the persons who drink them, but exercise a direct power in promoting the appetite and, by consequence, the general health and strength. Sulphureous water is heating and evidently stimulative:—it operates by the skin or the internal organs of excretion, and facilitates the cure of cutaneous and glandular diseases.—Water, then, possesses many qualities which, under appropriate exhibition, may be made eminently conducive to the security or recovery of man's health, in all the natural stages of his pilgrimage through life.

Lavements, whatever be the nature or virtues of the medicinal agents composing them, determine very rapid and extensive effects on the animal economy; and, by their possession of this remarkable property, may be so managed as to conduce, in a decided manner, to the repression of many diseases, especially those incidental to children. Being usually administered in a fluid state, the vehicle holding medicine in solution, admits of considerable variation:—it may be, for instance, and generally is watery, and consequently remains of itself quite inefficient; or it may consist of beer, wine, or diluted spirits, and by this means be qualified to communicate an increase of energy, to the active ingredients which it has been selected to convey. The liquid form is favourable to the ultimate application of their efficiency:—it per-

mits the remedial particles, at the moment of their introduction into the system, to come in contact with the excitable and absorbing surface of the bowels. They are ordinarily exhibited at a tepid heat; but, when it is desirable to obtain advantage from their primary impression, they may be cool or even quite cold:—in such cases, their chemical nature imports less than their temperature. Regard must also be had to their size:—when large, they excite the muscular fibres of the parts whose eventual contractions occasion their rejection:—such effects may be sometimes indicated; when they are not, the lavement should be small, when its operative retention will be longer and its influences more certain and diffusive. When the bowels are inflamed or exceedingly irritable, it is on many occasions necessary even to weigh the ingredients to be administered:—when heavy, they have a tendency to induce colic pains and gripings which are equally distressing and pernicious:—this result, however, may be prevented or mitigated by keeping them under four ounces in weight. When, in fine, it is requisite to give a lavement, with the object of producing the particular effects of a medicine included in it, there will always be propriety in premising the use of one that is simply aperient:—this, by leaving the bowels empty, disposes them to be influenced by the active properties of the substances with which they are afterwards to be filled.

Lavements, as every one knows, have their constituent materials diffused over all the lower portion of the alimentary canal, forming a great extent of living texture whose surface is lined by an appropriate membrane, and whose functions in the animal economy are very important. This surface receives many nerves, veins, and arteries; possesses an exquisite sensibility; elaborates a particular

secretion and exhalation; and is amply furnished with absorbing vessels:—hence, it has been regarded by some physiologists as the seat of a subsidiary digestion; and the proof of this is referred to the circumstance of persons in whom disease had suspended the power of deglutition, being nourished for several weeks by the sole means of alimentary lavements. By the peculiarity of their structure and the modifications of their vitality, therefore, these parts enjoy great susceptibility of admitting impression from various kinds of medicines when thus exhibited:—this is what facilitates the salutary application of lavements:—it enables them to produce remarkable organic changes, by their immediate influence on a surface whose vital properties are so eminently developed:—and, in proportion to the number of the absorbing vessels prepared to imbibe their active particles, they furnish the means of these particles being conveyed into the mass of circulating fluids and thus determine secondary effects equaling at least, if not more important than their primary. Let it not be overlooked, however, that these parts are destitute of that exquisite sensibility, that energetic absorptive power, those sympathetic connexions with other essential organs, which render the stomach and the upper portion of the alimentary tube the most appropriate and incomparably the best receptacle to which substances having nutritious or curative qualities should be committed:—hence arises the necessity of making the proportions of a medicine, when given in a lavement, generally double, frequently treble what they would have been if exhibited by the mouth.

Lavements are administered for a twofold purpose,—a simple evacuation of the organs which receive them,—and the communication of a particular property to these organs.

and, through their intervention, to the general system. For the first of these objects, tepid water or whey or milk, in quantity determined by circumstances, possesses every quality requisite to the indicated end. A lavement charged with medicinal substances, however, constitutes a mode of changing the tenour of diseased action, meriting the more attentive consideration and judgment, from its primary or immediate influences being often the most beneficial. The particles with which it is medicated, excite in the whole animal economy a series of effects that may be distinguished into general and local. It is evident that a lavement holding medicine in solution, when placed in immediate contact with the membrane that lines the lower bowels, will not only act primarily on the parts, will alter the actual order of their vital properties, will determine in them very observable organic changes;—but, it will propagate its active influences to distant systems; the medicinal atoms of which it is the depository shall be conducted into the sanguineous stream; shall be by it transmitted to every organ, and thus impart renewed energy to all their tissues. The variations which it is thus capable of introducing into the state of the arterial and capillary circulation, into the secretions and exhalations, into the cerebral faculties, and indeed into all the vital actions, constitute the most satisfactory demonstration of its extensive usefulness and its powers. By such means, then, and with much facility, can very diversified alterations be produced in the functions of the living frame:—its organs may be stimulated, their movements accelerated, their tissues invigorated, their energies augmented:—according, then, as the injected ingredients contain soothing or exciting, tonic or relaxing properties, such will be their corresponding effects.—By these remarks, which

might be usefully extended, let every person who may undertake the charge of tending the health of children, be induced to examine with attentive solicitude, the modes by which a lavement operates, and the peculiarities of influence it has the power of communicating to animated organization, and such evidence will soon be found as shall be quite demonstrative of its advantages and of the readiness wherewith it can be made the vehicle of substances endowed, in every degree, with alimentary or medicinal attributes. Let it also, in fine, be a general rule that when a medicine given in the form of lavement shall be capable of fulfilling any requisite intention, it ought never to be exhibited, by the mouth, to sucking infants, and seldom, if ever, to children till the processes of their first dentition have been completed.

Medicaments are healing compositions applied to particular parts or regions of the body, for the purpose of mitigating pain or suppressing morbid action. They are numerous:—among others may be noticed as capable of being regulated by popular discretion,—gargles, lotions, liniments, ointments, fomentations, blisters, poultices, frictions, and leeches.

Gargles are medicated fluids used for washing the mouth and upper portion of the throat:—their influence depends on their moisture, their temperature, or the qualities of the ingredients whereof they may be made the vehicles. The inside of the mouth and throat is lined with a delicate and sensitive membrane, over which a multitude of arteries, veins, nerves, and excreting vessels is distributed:—such applications, therefore, are adapted to change the vital situation of a surface so impressible;—they impart a new mode of action to its organs, and thus occasion a change in the exercise of their functions.

Their activity, however, has only a limited sphere:—it extends very little beyond the circumscribed spot to which they are applied. From their being but momentarily exposed to the action of absorbing vessels, their medicating particles cannot be taken into the circulation, nor be made to influence the general system or determine appreciable changes in its organic movements. According, then, to the qualities of the elements that compose them, do gargles affect living tissues and their functions:—and it is, in this way, that their topical employment has exciting or soothing, astringent or relaxing, and other beneficial effects. Children use them with difficulty, and thus deprive themselves of the advantages which might be obtained from remedies whose salutary influences are sometimes as palpable as they are sure.

Lotions consist of watery compositions wherein medicinal substances have been dissolved;—they are employed for cooling inflamed surfaces, for facilitating the discussion of tumours, cleansing ulcerations and cutaneous sores, for promoting the absorption of extravasated blood in parts which bruises or contusions have wounded and left blue or livid, for assisting the recovery of tone in textures that are sprained, and many other equally important intentions. Their application is always external, by means of re-iterated ablutions or of linen cloths kept in a state of saturation with the fluid, and generally at a temperature much lower than that of the surface on which they are employed:—their effects almost invariably depend on the degree of their coldness; sometimes on the influences of their particles having penetrated the interstices of the cuticle and been absorbed:—in such cases these particles exercise their own specific powers.

Fomentation is rather an act than a thing:—it means

the application, chiefly in flannel cloth, of warm water in its simple state, or impregnated by decoction or otherwise with the virtues of certain soluble substances. Fluids thus employed should never have a degree of heat exceeding what shall produce an agreeable sensation. For soothing, in this way, or relaxing lesioned parts, warm water alone will answer every purpose:—there may be a doubt whether any medicine applied under the shape of fomentation ever produced determinate effects on a living surface whose textures remained entire:—hence, where doubt is, there may be danger in delaying the use of other remedies adapted to produce more certain results.

Liniments are soft unctuous formations having an intermediate consistence between purified oil and an ointment:—the latter is firmer, and has usually the thickness of butter. When employed, the former is commonly accompanied with friction which of itself secures peculiar results. Various substances are occasionally added to the balsamic vehicle, for the purpose of fulfilling indications by means of their stimulating effects, their specific operation, or their chemical action. Generally, however, the principal intention in the application of ointments is, to keep abraded, vesicated, or ulcerated parts soft and comfortable, and to exclude the atmospheric air which retards their healing:—the simplest composition of this kind, therefore, that has proper consistence and tenacity, naturally conduces best to the attainment of this object.

Blisters are well known:—when placed on the skin, they raise the cuticle in the form of a vesicle containing transparent lymph. This effect can be produced by various substances, but the vesicating fly in powder acts with most certainty and expedition. Such applications deter-

mine a lively excitement of all the animal economy; they rouse oppressed or enfeebled tissues; impart new energies to organs, and thus re-animate their languishing functions; and they exalt, throughout the system, its general tone which is the source of its vital forces. Their action is primarily local:—ultimately it extends to many or even all the systems, particularly the sanguineous, producing restlessness, increase of animal heat, and perspiration:—the former is derivative, the latter tonic:—it makes less impression on corpulent, soft, phlegmatic people, than on those having a dry constitution, the lean, and the nervously irritable. Sometimes, especially if the blister be large, it excites a considerable degree of feverishness, which may be inadvertently regarded as an aggravation of the disease; but this gradually decreases as the local irritation subsides.

Previously to blisters being applied, the parts should be well washed with warm water and soap, and afterwards submitted to brisk friction with a cloth that is dry, rough and hot, or well moistened with heated vinegar or spirits. If reddening and excitement only of the surface be desired, the blister ought to be removed in about five hours:—in eighteen or twenty-four, it will have produced its complete effects. When, from a particular state of the system, an extreme activity of the blistering ingredients, or from their being allowed to act for an undue length of time, a deep ulcer becomes the result, this is usually slow of healing and emits a copious purulent discharge, which tends greatly to debilitate a sick person and to protract an otherwise favourable convalescence. Experienced parents will easily recollect having observed and been made unhappy by such an occurrence after blistering children:—it may be prevented, however, by determining

the degree of this operation, not by mere *time*, but by the progress of its *effects*. In young children, all blisters ought to be removed immediately on the skin being uniformly reddened; after which, a warm poultice shall secure for the little one all the advantages and, at the same time, save it from many of the distresses that a more palpable vesication would have induced. When blisters do not operate, the cause may be inactivity or other imperfection of the materials employed, or defect of vitality in the body's superficial textures:—the first admits of an easy remedy; the second announces the disease's intensity and the extent of its ravages. Occasionally, however, on the vital powers of a person having rallied, the full vesication of parts will supervene, many hours after a blister has been removed:—this furnishes sure evidence of the general circumstances being ameliorated, and of life having returned, as it were, to organs remotest from the centre and, by its new energies, invigorating their functions.

Blistered surfaces require the simplest dressings:—these may consist of cloths smeared with cream, or butter, or purified lard; and it is most necessary that attention be had to renewing them so often as they become dry. When the sore has been made irritable, it should be carefully washed with tepid water and milk, and have repetitions of the common poultice in a warm state, till the redness and pain shall be removed:—precautions also ought to be taken, on every occasion, for preventing such sores, as much as possible, from being exposed to the action of atmospheric air.

Poultices may be so managed as to fulfil different intentions, according as the degree of their temperature is low or high, and as the qualities of substances impregnating their composition is general or specific. Most fre-

quently they are employed for the purpose of soothing uneasy or painful feelings in a part which, by whatever means, has been brought into a state of irritation,—of defending excoriated, ulcerating, or wounded sores from the external air during the progress of their natural cure,—of allaying inflammatory excitement, or preventing its terminating in suppuration,—and of maturing or purifying abscesses when such indications are required.

Many different kinds of inert or innocuous substances, the invention of popular wisdom, are often added to the common poultice, or substituted for it, under the idea of their contributing to determine particular effects:—all these compositions, however, are quite unnecessary, and the preparation of them not unfrequently occasions prejudicial delay. Whatever is capable of longest retaining coldness or warmth, moisture, and softness, forms the preferable discutient or relaxing poultice;—that made of bread and milk, when not too thin, is good; but the action of animal heat from the body has an aptness to make it sour:—that, therefore, is decidedly the best and most convenient which consists simply of bread and water, with the addition of some linseed-meal deprived of its vegetable oil:—this ingredient improves its consistence and secures its particles from adhering to the skin. It is necessary that these compositions have such a degree of thickness as shall enable them to preserve a certain form while applied:—when quite simple, they may be contained in a very thin soft bag, which renders them more comfortable, and has no tendency to diminish their efficacy. When, however, they include medicinal substances intended to be the cause of chemical or other effects, their right operation depends on their being placed in immediate apposition to the affected surface. Much advantage

results from their being often changed:—if influences are desired from their coldness, let them be removed before they have become warm; if from their hotness, before this has descended to the temperature of animal heat.

From the innumerable ramifications of the capillary vessels, both venous and arterial, which penetrate the cutaneous textures; the abundance of absorbing tubes distributed over them; and the multitude of nervous filaments that give them sensibility, it is quite manifest that poultices, in their simple or medicated forms, can be made remarkably efficient in counteracting the impressions of disease in many of the living structures:—they may, among others, exercise an emollient, tonic, exciting, irritating, or anodyne action. By their property of communicating warmth, they relax the cuticle and open or separate its pores; and, by thus making it permeable by medicinal particles, expose them to be imbibed by the lymphatic or venous absorbents and, through these, to impart their specific influences on the vital functions. Poultices, in fine, can be usefully and conveniently substituted for blisters, opiates, aperients, emetics, and all such medicines as offend or injure the stomachs of infants and children.

Friction is a natural method of affecting the body's surface and, through its sympathetic connexions, of changing the nature and modes of the vital actions. It is usually exercised with the bare hand of a sick-nurse, with a piece of dry flannel or similar material, and with some fluid or soft composition for the purpose of conveying the impressions of stimulant and other medicines, by means of absorbent vessels and the circulating blood, to remote parts whose operations are subordinate or essential:—hence its power of exterminating the diseases and reno-

vating the energies of the human constitution. Whoever reflects on the importance of the skin's functions, its relations with many internal organs, and the necessity of maintaining, for the sake of health, a just degree of reaction between them, will readily comprehend the extent of this power and the wisdom, as well as the expediency, of applying it to useful ends.

Persons who suffer themselves to lead a life of habitual indolence or to be enervated by the debasing effects of absolute idleness, and those who take soft or succulent food to an inordinate extent, very rarely enjoy good or comfortable health:—in them, the elements of nutrition, directed by vicious forces, are unequally distributed:—not a few of their organs, endowed with an excess of activity, appropriate, as it were, to their own use these elementary particles in undue proportion, and thus give rise to congestions and morbid enlargements:—others, placed in a state of great and permanent constriction, turn aside the nutrient atoms or expel them by means of the secretions; and, from the consequent defect of assimilation thus induced, feebleness and extreme emaciation necessarily result. In such circumstances, friction judiciously practised, will contribute effectually to the prevention of these inconveniences. In the first kind, when impressive and long continued, this remedy communicates activity to the secretions, imparts a vibratory movement to the cellular and other soft textures, and causes the fluids to circulate with freedom and increased velocity so as to present themselves, in abundant successions, to the secreting vessels which disembarass the different systems of all excess of depraved nutrition:—and, in the other kind, friction with soft substances, performed only for a short time and frequently repeated, has the best effects, by re-

laxing the skin and subjacent structures, and by promoting in them a right distribution of the fluids which hastens the re-establishment of health by restoring their natural relations to the assimilating forces—at the same time, it facilitates the process of transpiration, invigorates the nervous system, and diffuses a general sense of well-being over all the animal machine.

Frictions, simple or medicating, are very useful in all spasmodic, intermitting, and periodical affections:—they favour the development of small-pox, measles, and other eruptive diseases, and their re-appearance when repelled:—they promote the discussion of tumours and swellings, whether dropsical or flatulent:—they retard or prevent the progress of obesity;—they act kindly in subduing slowness or confinement of the bowels, and in counteracting the effects of indigestion or atrophy, by their influences on the equal applications of nutrition:—they conduce to the removal of internal congestions and morbid enlargements of organs, particularly those of the liver:—and, they have often proved beneficial in palsy, apoplexy, and many disorders of the circulation, in lethargy, insomnolency, general nervousness, hypochondriacal and hysterical complaints. Adult persons will find the habit of undergoing appropriate frictions both grateful and salutary in almost all their conditions; but it ought to have a distinguished place in the daily discipline of health and in the management of disease, in every stage of youth.

Leeching, so as to abstract blood from a particular part sustaining inflammation, fulness, or pain, is very useful in many diseases especially those of children.—The horse-leech may be mistaken for the medicinal, but it is larger than the latter. Its skin also is smoother and glossy; its body depressed; the back dusky; and its belly yellowish

green, having a yellow lateral margin. When the leech is of the right or medicinal kind, its body has a blackish brown colour, marked on the back with six yellow spots, and edged with a yellow line on each side:—these spots, however, as well as the lines, grow faint and almost disappear at certain seasons. Its head is smaller than the tail, which the creature fixes very firmly to any thing when it pleases; and is armed with three sharp tubercles strong enough to pierce the skin of a man, an ox, or even a horse:—it makes three wounds at once with this singular instrument. The mouth forms, as it were, the body of a pump and its tongue the sucker; and, by the working of this admirable piece of mechanism, the blood is made to rise up into the conduit which conveys it to the animal's stomach:—this is a capsular membrane divided into twenty-four small cells, wherein blood can be preserved for several months almost without coagulating, and thus prove a store of provision for the creature's future subsistence.

Leeches may be employed in every case where topical bleedings are required, or where venesection cannot be performed. Before applying them, all the parts should be carefully washed;—first, with hot water and soap, for the purpose of removing, as much as possible, the particles of the cutaneous excretion which the leech instinctively dislikes, especially if impregnated in any degree with the odour of medicine;—and secondly, with milk and water as warm as can be endured, with the object of stimulating the superficial vessels and filling them with red blood. The attendant who undertakes managing them, should use the precaution of having the child's or other person's dress quite clean and fresh, before the operation commences; and it is absolutely indispensable

that this attendant's own hands be purified, by diligent washing, of every thing that has a flavour and is bitter or saline. The mere putting a hand, to which any fœtid medicine adheres, into the water where leeches are kept, is often quite sufficient to deprive many of them of life:—the application of a minute proportion of any saline substance to their skin immediately occasions the rejection of whatever their stomach contains:—and the least odour of any medicament, applied by friction, poultices, plasters, or otherwise, remaining on the skin, or even the accumulation of perspired matter, will prevent them from fastening.

When proceeding to apply a leech, the clean, dry, bare hand alone should be used; and, if it is restless and refuses to bite, a drop of blood-warm, sweetened water, or of new cream, should be put on the part, or a minute puncture made in the cuticle, when the animal will generally proceed to operate. Should other means have failed of bringing a leech to settle, it may be confined on the part by inverting over it a wine-glass or other small transparent vessel:—but it is unnecessary to continue such attempts beyond a very few minutes, for they seldom succeed after this time; and, even if the leech shall be compelled, as it were, to fasten, the previous handling and other rough usage exhaust its strength and disable it from sucking with vivacity. When employed to bleed the gums, leeches should always be watched, lest they find their way into the stomach:—their movements require also being attentively observed when placed in the vicinity of the ears, nostrils, or lower extremity of the bowels:—on such accidents occurring, the best remedy is to swallow a little salt or to introduce it by injection:—touching their head with some salt, spirits of hartshorn, pepper, or vine-

gar, makes them readily quit their hold. If it be desired that a leech shall draw a larger quantity of blood, it has been recommended to cut off the end of its tail, when it will continue sucking to make up the loss it sustains:—there is a cruelty, however, in all such practices from which humanity revolts; it is preferable to increase the number of animals. On their removal, a *few grains* of salt applied to the head is quite sufficient, and infinitely more gentle than that of drawing them forcibly through the fingers, for the purpose of making them reject the blood they have drawn:—by being wholly covered with the salt, as is often done, they are either seriously injured or absolutely destroyed.

The bleeding which spontaneously follows the bites of leeches, is usually regarded as being greatly more serviceable than the discharge of blood by their sucking; this, however, is an incorrect view of the matter:—the means used to promote such bleeding, necessarily annoy and fatigue the sick; they have great aptness to counter-vail what benefits are expected from the leeching; and the discharge induced in this way partakes much of the nature of hæmorrhage by which a very small loss of blood is more certainly exhausting and injurious than a copious abstraction of that fluid with the lancet. Parents, from pure ignorance, entertain more apprehension of a number of leeches than of the effects which a dribbling effusion of blood imparts to the whole system:—their rule, nevertheless, should be,—to apply as many of these most useful animals as shall at once withdraw the requisite quantity of blood,—and, immediately on their being removed, to cover each of the wounds with a piece of caddice or surgeons' lint dipped in a cold solution of alum, or in fine powder of kino, or catechu, or of galls.

Such are the best modes of employing leeches for medicinal purposes when, by their operation, the losing of blood is clearly and absolutely indicated. Let it, however, be admitted as a general axiom,—that, *unless in such circumstances of disease as cannot be counteracted by other remedies*; no mother ought ever to lose blood by leeches, the lancet, or any means whatever, during the time when her new one is passing through its foetal state; because every such loss of blood makes proportionately defective or impoverishes the natural supply of that vital fluid on which the growth and temperament of her baby most essentially depend:—no mother or nurse should be subjected to blood-letting so long as she continues to suckle an infant; because every loss of blood does very materially lessen or deteriorate the maternal milk, and consequently does injure the young one in all its constitutions:—and, no growing person should sustain artificial loss of blood, because this tends much to retard or render imperfect the organic developments and to enervate the general health, by withdrawing part of the supplies whereby these are maintained.

Medicines operate on the human frame by exciting to action either the whole system or particular organs; and, according to the kind and degree of their stimulating influences, very different effects are produced. Some of them, not long after being transmitted to the stomach, begin determining an increase of vigour, which is conspicuous in the force of the circulation, in the nervous manifestations, or in the body's various functions; others are tonics, and have the same general effect; but it supervenes more slowly, and is scarcely appreciable except from their repeated administration:—the former are usually more transient in their operation, and the high ex-

citement resulting from them is ultimately followed by proportionate langour; these may be esteemed as sedatives;—the latter have more permanency, and their gradual excitement, though it does not occasion sudden changes, is fitted to be the cause of more lasting impressions. An important difference, moreover, has place among the stimulating medicines:—the action of some is general, with regard to the system; that of others is peculiarly directed on individual organs:—hence, some substances, on entering the stomach, not only produce on it a stimulant effect, but extend this to the general economy; while others, without exercising any evident action on the stomach and still less on the system, excite particular organs; as, for instance, the bowels, kidneys, or exhalant vessels of the skin. With this local action, many of them exert, at the same time, more or less of a general operation by which they are capable of inducing determinate influences; and many of them, also, by peculiarity of administration, act specifically on more than one of the living textures, by which their effects can be still more diversified. When thus determined to particular parts, they are either *directly* conveyed to them by being received into the blood; or their action is communicated *indirectly* from the stomach, through the intervention of nervous agency:—in both these ways, important local effects can be procured. Many substances, as mercury, being assimilated with the food, enter into the composition of the chyle, pass with it into the circulating blood and, accompanying it to particular organs, often excite in them peculiar actions. Such effects usually take place on secreting organs, and frequently the foreign substances, as nitre or alkaline salts, are separated with the secreted fluid and thus affect the discerning vessels. Most generally,

however, the operation of medicines taken into the stomach is extended by means of nervous communication:—they make on the sentient fibres of that organ an impression, which is transmitted by a continuity of nerves to very distant parts:—the proof of this is in the rapidity with which the specific action of such remedies, wine or opium for instance, is produced. It is a remarkable fact that this communication between the stomach and remote parts, does not take place when the brain and spinal marrow have been destroyed, though the heart and vascular system remain uninjured:—thus the stomach, besides being a vehicle of conveying substances into the blood, is also that by which they can be brought to act on the system, through the intermediacy of the nerves.

Effects, having nearly a similar nature, can be obtained by applying certain medicines to the surface of the body:—sometimes, these effects are transmitted by nervous communication; sometimes the particles so applied are absorbed by the lymphatics or veins, and in this way pass into the blood. Opium applied to the skin, either in a solid or fluid form, relieves pain and removes spasmodic affections, whether general or local;—tobacco placed over the stomach, excites vomiting:—and garlic laid to the feet, acts as a powerful stimulant and raises the pulse's strength. Friction, by introducing mercury, antimony, and other active substances through the cuticle, prepares them for being absorbed, and thus carried into the circulating mass. Medicinal particles, moreover, besides acting as stimulants, sometimes occasion mechanical or chemical alterations in the state of the fluids or of the simple solids; and although the living economy be endowed with peculiar properties and modes of action incapable of explanation on mere mechanical or chemical principles, and al-

though external powers act upon it so as to produce changes conformable to the peculiar properties of life, still these very changes can be so modified as to determine the most salutary results.

Such, then, is a general view of the manner in which the different kinds of medicine are known to operate, in rebalancing the deranged functions of life:—it may be interesting additionally to explain the peculiar nature and properties of those that have the laxative and emetic qualities, as being the most frequently employed in opposing the various tendencies of disease, during the successive epochs of infancy and youth.

Laxative, aperient, or opening medicines are those which act by inciting the intestinal canal so as to increase its natural motions, and thus cause its natural contents to be more quickly propelled and evacuated. Some of them stimulate the extremities of the exhalant vessels that terminate on the inner surface of the bowels, and thus induce their furnishing a larger portion of the mucous fluid:—this renders the dejections more copious and of a thinner consistence:—others merely hasten and augment the natural discharge. By means of sympathetic communication, their excitement extends to almost all the adjacent organs:—hence they promote the secretion and increase the rejection of bile and the secretion of, mucous fluids poured into the intestinal tubes. Some of them, moreover, incite the bowels throughout all their length; others, such as the aloë, have their action confined to the lower portion:—and others, again, affect the stomach, either by association with the intestinal motions or by their own direct influences, and thus accelerate the downward progress of its contents:—this is the cause why a saline draught not unfrequently operates in half an hour after

being exhibited. Many laxatives act mildly, without causing any general affection of the system, or even exciting perceptibly the intestinal vessels; they merely facilitate the actions by which the bowels are unloaded:—others are powerfully stimulating; and, if taken in too large a dose, have the power of exciting much irritation and even inflammation of the surfaces with which they come in contact.

Aperients are capable of fulfilling many indications, and consequently, can be made to contribute in an eminent degree to the removal of a multitude of morbid affections. When the bowels have extraneous bodies lodged in them,—when there exists a retention of their natural contents,—and when these contents possess acrid qualities, their prompt evacuation by means of an opening medicine, externally or internally administered, is the obvious method of treatment:—in every general disorder of the system, likewise, their use, under proper modification, is really indispensable. Many diseases, accompanied with long confinement and a bad state of the dejections, will not yield to the occasional administration of an evacuating dose:—they require a systematic continuation of the mild laxative excitement till such time as the excretions cease to be peculiarly offensive and to have unnatural appearances; till, indeed, the healthy and free condition of the bowels be restored.

These remarks apply in a particular manner to the very salutary effects of aperients in all the febrile, inflammatory, exanthematous, and asthmatic states,—in nervous, spasmodic, convulsive, maniacal, dropsical, scrofulous diseases,—in that emaciation which attacks the young of both sexes and is characterized by loss of appetite, weakness and a wasting of the body ending in total prostra-

tion of strength,—in the spitting of blood to which females are liable between the eighteenth and thirtieth year of their age,—and in head-aches, pains of the stomach, palpitation of the heart, indigestion, lethargies, palsies, and apoplexy.

Medicines capable of producing effects so remarkable, so manifold, and so beneficial, do obviously require being warily administered:—hence it comes, that much circumspection and judgment in selecting both the *kind* and the *powers* of an opening medicine are, on every occasion, most requisite:—the indiscriminate exhibition of such to children is always dangerous; often, in the highest degree pernicious. Parents, therefore, shall do right, at all times, to be sparing and well advised in administering even these most useful remedies to their young ones:—the very simplest among them, by injudicious employment, may derange the vital actions to an extent, which the wisest and most experienced of Nature's help-mates shall not be able to repair.

Emetics are those substances, mineral and vegetable, which induce vomiting by imparting, through the means of a characteristic principle in them, a peculiar kind of excitement to the sentient and contractile fibres of the stomach, diaphragm, and abdominal muscles, and thereby inverting their natural actions. The susceptibility of being affected by these medicines varies greatly in different individuals:—it is also liable to be altered by disease. They act readily on persons suffering from fever:—in almost all the forms of low nervousness, their specific effects can be produced with much more difficulty. Vomiting almost constantly attends those cases of poisoning where the deleterious drug has a natural tendency to excite inflammation of the stomach:—in those where it acts by

a narcotic power, as laudanum, which impairs the irritability of that organ, the most powerful emetics not seldom fail of inciting it to reject the noxious substances by which its energies had been overpowered:—on all such occasions, the frequent and forceful dashing of cold water* on the head, breast, and back of the unfortunate patient, constitutes the most convenient and the surest means of preventing the deadly somnolency which is in progress,—of rousing the nervous sensibilities and general powers of life,—and of thus securing the advantages of such other remedies as may be indicated.

Mild emetics do not appear, by their operation, to waste the irritability of the stomach:—they tend rather to renew its vigour; and this effect is made perceptible by the desire of food and the activity of digestion which generally follow moderate and salutary vomiting. Physicians successfully avail themselves of this property, and prescribe mild emetics for the removal of gastric acidity, for impaired appetite, and all kinds of indigestion, for counteracting the temporary diminutions of tone which inebriety occasions in the assimilative organs. Vomiting, moreover, produces in the stomach a particular state which is often communicated to the skin; and, by the consequent perspiration, forms a most efficacious means of removing spasmodic stricture from the body's surface:—it has also a remarkable power of increasing absorption; and, thereby, promotes the discussion of dropsical swellings and collections:—when violent, it has some-

* This most valuable improvement in practice originated, I believe, with my excellent friend Dr. James Copland of London:—it has been employed, in several instances, by other physicians with decided success.

times been followed by the sudden disappearance of tumours which had resisted judicious local treatment:—it is, in fine, most beneficial in certain modifications of jaundice; in colds and asthmatic affections; in feverishness; in some inflammatory states of the eyes and eyelids; in particular circumstances of the pulmonary consumption, by facilitating expectoration; and, in chincough, by tending equally to interrupt the return of the paroxysms, and to keep the lungs unloaded of the mucous fluid by whose accumulations the coughings are determined.

Emetics exhibited in slightly nauseating doses check the spitting of blood; and, in general, may be so administered with advantage in the several kinds of hemorrhagy. Their use in full doses, however, is always hurtful and often dangerous,—in cases where there exists a determination of blood to the head, especially if the person be of a full habit,—in inflammations of the large internal organs,—in debility resulting from sickness or intemperance,—and in all the varieties of disease which inordinate action of the abdominal muscles would tend to aggravate. They should always be administered in fluid form; and it is best to give them in the evening, as their operation leaves a tendency to sleep and to gentle perspiration, both of which it may be useful to promote:—they should be taken in such doses as shall excite vomiting, twice or thrice, at moderate intervals; and, each time the sickness and retching recur, their tendency may be perfected by draughts containing six or eight ounces, for example, of tepid water or a bitter infusion. These draughts ought never to be very large, as they then render the efforts at evacuating the stomach more painful and difficult.

Ipecacuan and tartrate of antimony are the most com-

monly used, of all the substances, vegetable or mineral, possessing emetic properties. The former is the mildest and, at the same time, sufficiently certain in its operation:—by these qualities, it is peculiarly adapted to the circumstances of children, and to all cases where an excess of effect would be prejudicial. Adult persons may take from twenty to sixty grains of its powder, for a dose, with perfect safety:—it should be suspended in at least four ounces of cold water, having its particles well moistened by smart agitation:—this prevents any atoms of the medicine from adhering to the membrane that lines the mouth and gullet, and from irritating them by its acridness:—and, when the vehicle is a tepid fluid, this tepidness of itself has an aptness to induce vomiting independently of the ipecacuan, or at least to hurry its operation and thus lessen its specific effects:—this emetic, therefore, is always most advantageously administered in the form of a cold draught. Wine of ipecacuan and its watery infusion are decidedly the best means of exciting vomiting in children; and they ought to be exhibited in divided doses, as for instance one or two tea-spoonsful of the former and three of the latter, repeated every four or five minutes till the medicine's action has commenced:—when thus given, their effects are much more extensive, and frequently extend themselves from the stomach, to the bowels and the skin.

Emetic tartar is distinguished for the certainty of its operating, and for the action it excites in the stomach being more forcible and more permanent than what results from any other substance. Generally it influences the bowels; not unfrequently the cutaneous surface:—in the former case, it becomes an active aperient; in the latter, it causes a salutary perspiration. This medicine is em-

ployed more particularly when the effects of free vomiting are required:—but it is always liable to act harshly and to debilitate the organs of digestion; and, consequently, is unfit in any, even the mildest form, for administration to children or to persons having weak and irritable constitutions.—When emetic tartar is applied to a wounded part, vomiting, sinking of the pulse, inflammation of the stomach and bowels, and a miserable death, inevitably ensue:—these dreadful effects result from its being absorbed, and carried into the stream of the all-pervading blood. Let this most instructive fact, then, deter every one from exhibiting antimonial wine, or the gentlest preparation whatever of this powerful drug, to children or indeed to any one, having soreness, abrasion, or ulceration of the mouth or gullet or other portion of the alimentary canal.

However simple or innocent, then, their familiar use may make such medicines appear to the observation of the inexperienced, it is quite obvious that their effects are very powerful and extensive. Let much caution, therefore, be exercised in venturing to administer them:—let it also be known and regarded as an established fact, that medicine of every kind as well as the disease for which it may be exhibited, is altogether repugnant to the sympathies of animated nature:—and let it be added, in conclusion, that all parents should consider well whether they shall best promote, by medicine or by management, the healthy progress of their children's growth and constitution. During infancy, all the desires and movements and actings of the young one are purely instinctive; and it is the peculiar function of instinct to seek what is salutary and to shun what is unhealthful:—it is, therefore, beyond measure ungenerous to allow fondness or fancy to

create in them artificial appetites which undoubtedly have a determinative relation to disease. Whatever instinct craves, instinct,* if left unfettered by the inventions of erring reason, shall be sufficient to teach all mothers how to supply:—it will teach them, by even imitating the *manner* of irrational animals, to provide,—what is all they need,—for their nurslings enjoying perfect freedom of their members, security from cold and the unwholesome air, and their natural food and exercises, at right intervals:—and, when thus managed, infants shall rarely suffer from pains which they cannot possibly describe, and shall still more rarely require the assistance of medicine to relieve them from distresses to which the misguided affection of parents too often gives rise.

These remarks on the nature and efficacy of certain remedies are now to be followed by descriptions of the Diseases of Children, and of their treatment so far as that can be safely entrusted to popular management. Beyond this point, these rules do not extend:—what farther means shall, in each instance, be judged necessary ought at all times to have the sanction of professional skill and experience. Precision of arrangement does not seem to be absolutely indispensable in a work like the present:—it may, therefore, be sufficient to bring the

* “Maternal instinct, if left to itself, will generally suggest the best means of satisfying the mere instinctive desires of infants: these are pure natural appeals to what, in sentient beings, is natural: but it often requires the utmost ingenuity of the inventive and reasoning faculties, to supply the wants that have been created by the abuse of knowledge and intelligence.”—This beautiful and original sentiment was that of a Lady whose unforgotten excellencies often draw forth a mental repetition of the Poet’s inimitable complaint. *Night Thoughts*, N. iii. v. 110.

train of juvenile affections under the notice of parents, according to the subsequent plan:—1st. the *fœtal* diseases which have place during the first state of existence; 2d. *topical*, those that occupy particular or circumscribed situations, including what may be considered as peculiar to the upper and lower extremities, are unaccompanied with general symptoms, and usually require being treated by external or operative applications; 3d. *abdominal*, such as are understood to have their principal seat in the belly; 4th. *thoracic*, those more intimately connected with the inside of the chest and neck; 5th. *cephalic*, those chiefly seated in the head, face and mouth; and 6th. *cutaneous*, such as universally or to a considerable extent, affect the body's surface.

FŒTAL DISEASES.

DISEASES of unborn children may be enumerated here as an interesting portion of the natural history of mankind; but they are beyond popular interference and their remedies, when remediable, rest principally with the surgeon, after birth.

Unborn beings are exposed to have a variety of affections, sometimes originating in themselves, sometimes in the sources of their life. Such affections seldom occur, however, in the progeny of parents who possess a sound constitution, a cheerful disposition, and a happy mind:—who, in few words, are prudent, and temperate, and undiseased. Intensity of mental feeling, inordinate bodily exertion, and all excess of the natural evacuations, render its maternal nourishment defective or insalutary and, consequently, impair the new one's forming constitution:—

compression of the mother's person, by a vain or negligent use of dress, contributes almost directly to produce deformities of its corporeal structure:—and, it suffers in all its systems and is generally puny and nervous when, by bleeding or otherwise, she experiences important losses of blood. Blood, indeed, is the giver of life and material substance;—no female therefore, except for urgent reasons, should be made to part with any portion of this essential fluid so long as her growing offspring is proceeding through the state antecedent to its birth. It is remarkable that *general* diseases are much more readily transmitted from parents to their children and thus become hereditary, than those that have their seat in a *particular* part or organ:—thus, the deaf, dumb, lame, or maimed very seldom, if ever, communicate their personal defects to their descendants; while the gouty, hypochondriacal, epileptic, and scrofulous are liable to perpetuate these affections in their family.

Among other foetal maladies the following come most frequently under observation;—fractures of bones, luxations of joints, rickets, defects and deformities, wounds and scars with loss of substance, lesions of the abdominal and thoracic organs, different kinds of tumours, small-pox and other cutaneous diseases, water in the head, and various convulsive or nervous affections.*

* Whatever powerfully or painfully affects the mother's mind and thus disturbs the serenity of temper and feeling so requisite to her own and her baby's well-being, during its foetal conditions, has a strong tendency to communicate the worst impressions to her nascent offspring, and to make it feeble and timid and nervous while it lives:—the instinctive horror of a naked sword which never left the gentle nature of James VI. has been referred by physiological reasoners to the effects of terror excited, not long be-

Fractures and dislocations, and all such organic defects and deformities of the foetal being as are susceptible of adjustment by chirurgical operations, come to be so managed on their discovery after the young one's birth. Rickets in the unborn babe does sometimes, but very rarely occur:—nevertheless, it is known and has been accurately described. It is characterized by convexity and distortion of the back, similar disfigurement of the chest, and by softness and flexibleness of the bones. During this period also, effusions of watery fluid, of purulent matter, and of blood, have been detected in the chest and the membrane which includes the heart:—multitudes of miliary tubercles occasionally occupy the surface of the lungs, and abscesses are often found in their substance. Alterations, equally frequent and equally remarkable, take place in the abdominal organs:—and, besides the different collections which accumulate in the belly, the tubes that pass from the kidneys to the bladder have been found greatly dilated and filled with a saline liquor. Tumours, moreover, form on the head and other parts of the body, and exhibit great variety in their nature and consistence.

There has been a question, whether the small-pox can be communicated by the mother, to her child during its foetal age. Sometimes, this remarkable circumstance has occurred; and, at their birth, well-formed pocks, or their crusts, or their marks, have existed on the babes of females suffering from this destructive malady. Two women were exposed to the contagion of small-pox but neither became affected:—one of them had formerly pas-

fore the prince's birth, in his mother by the perpetration of a cruel murder, in her very presence.

sed through the disease proceeding from the natural origin; the other was vaccinated, at a time when the small-pox epidemically prevailed. Immediately after being so exposed, each of them gave birth to an infant, and both their infants were covered with the pustules of small-pox. Now, these observations go far to prove the extreme subtlety of the contagious principle of this eruption, which was transmissible to the children through the persons of their mothers, who perfectly escaped being affected;—and the incontrovertible efficacy of the cow-pox in securing the human frame from the effects of the varicellous contagion.

TOPICAL DISEASES.

INFANTILE diseases requiring external applications chiefly for their treatment, comprehend several interesting varieties:—before proceeding to delineate the peculiarities of these in consecutive order, however, it may be appropriate to commence with describing the practices best adapted to restore the suspended processes of animation in still-born children:—this condition should be viewed as intermediate to the two first branches of the present arrangement.

I. Unborn beings have their lungs perfectly inactive; but, as was stated in a former section, they derive all the advantages of respiration from a process peculiar to the foetal state. During this, the maternal blood, communicated to them by means of an appropriate circulation, incessantly supplies the elements of their growth and vitality. Breathing in them begins at birth, when the external air descends into the infant's lungs, and originates the alternate expansions and contractions of these organs,

by means of which the blood's uniform distribution, the balance of nervous energy, and consequently all the manifestations of sensation and life are supported. Immediately, therefore, on going into a new state, it exhibits, when vigorous, the ordinary evidences of possessing the animative principle:—it respire, gasps, and utters cries. When these signs are wanting, its exact circumstances ought instantly to be ascertained. If the mouth, nostrils, and throat be free of every obstruction so as to admit the passage of respirable air, and if there be a throbbing in the cord by which the circulation of blood in her babe still has communication with, and is maintained by, that of the mother, this natural connexion should not yet be interrupted. This was the primary source of its subsistence; and, while it continues to be indicated by regular pulsations, there is hope of an unbreathing infant being revived. In the mean time, with the face left uncovered, all its body ought to be kept warm under the bed-clothes, and have the chest and belly actively rubbed with the warm hand of an attendant. Such means, in many instances, succeed in stimulating its unpractised organs to resume their new functions; when, therefore, this happy event is announced by its cryings, its final separation from the parent may be completed.

On its being found at the birth, however, that the cord has already ceased beating, or so soon as its pulsations shall have distinctly subsided, it is to be immediately tied and divided, and the infant detached from the last of its maternal connexions. Unless there is certain evidence, in the state of the body, of its being irrecoverably dead, the promptest measures must now be instituted with the object of preventing the escape of animal heat, of establishing the functions of the lungs and heart, and

thus of promoting the young one's resuscitation. While, therefore, a warm bath is preparing, it is to be kept well covered with flannel; and then, with the least possible delay, all except the ears, eyes, nostrils and mouth, immersed in water heated to the temperature of the mother's blood and strongly impregnated with whisky, or preferably with spirits of hartshorn. With a soft feather, or hair-pencil the mouth and nostrils are next to be cleared of what mucous matter they may contain, and the latter stimulated by the fumes of the hartshorn or aromatic vinegar, with the body still lying submersed in the bath. In imitation of natural breathing, the attendant is then alternately to breathe with considerable force into the wind-pipe, and to expel the air thus inflated, by pressing on the chest and pit of the stomach. At the same time, an assistant should keep making rapid but slight compressions with the hand on all the abdominal regions:—this method has not the tendency of frictions to abrade the cuticle when rubbed under the water. Should these means fail of proving successful by the end of twenty or thirty minutes, the child may be removed from the bath and dried; and, while inflations of the lungs and friction of the spine and all the person with hot, soft, dry flannel, are sedulously continued, a small lavement made of milk, holding a teaspoonful of spirits of turpentine, may be administered. This may be repeated even more than once; and, at the same time, a poultice composed of bread and hot spirits, with some powdered mustard very thinly spread on its surface, applied over all the left side for the purpose of exciting the heart.

So long, then, as the navel-string continues throbbing it should *never* be divided till respiration begins:—it may be punctured so as to admit a small loss of blood, for the

sake of relieving the brain, if the head had been compressed in the birth. When, in fine, all pulsation in it has ceased, whether from the first or afterwards, the cord ought to be promptly cut and the proceedings destined to originate the processes of breathing forthwith commenced.—By such means, many still-born children have been revived. Their efficacy, however, depends in a chief degree on the steadiness and perseverance wherewith they shall be employed:—an hour at least should be devoted to the prosecution of an object so interesting, but which unfortunately so often fails of being attained.

II. Dislocations of the joints of infants, particularly of their shoulders sometimes of the neck, are occasionally found to have place at their birth:—the former can be easily reduced by a surgeon; the latter is almost, if not necessarily, always fatal. When the lower jaw has been disjoined, by yawning or other cause, there is propriety in having it replaced with the least possible delay. With this design, therefore, if professional assistance cannot be immediately obtained, an experienced mother or nurse may accomplish the reduction, by placing the thumb of each hand on the back of the mouth, and the fingers under the jaw, so as to depress and, at the same time, draw it gently forward for the purpose of disengaging the heads of the bone; and, when this is observed, the chin should be carefully raised and the muscles will guide the jaw into its place.—This accident has happened, when the mouth stands open and cannot be closed.

III. Fractures, at birth, are usually in the collar-bone or one of the extremities. When this injury occurs in the former, the rising end of the bone can be perceived:—it is treated by tenderly drawing back the shoulders and confining them in that posture by tying the clothes with

tapes so as to produce this effect. Sometimes, one or more pieces of aromatic plaster, laid over each other, are placed on the parts; but their presence is certainly inconvenient, and their good influences at best but doubtful.—Fractures of the arms or lower limbs, in children, require a nice management which it is manifest, their parents cannot undertake.

IV. Sometimes the natural processes which accomplish the birth of a child, compress the head so much as to leave indentations and furrows in various parts of its surface, and even to determine a remarkable swelling of the crown. All these appearances, however, are in general quite harmless and transient:—gentle frictions with the nurse's hand, or with warm spirits, vinegar, or port wine, and covering them, after being well dried, with a piece of soft chamois-leather, very soon ensures their removal.

V. When entire closure of the excreting passages, or of their nostrils, eyelids, and ears, has place in infants; when their toes or fingers are joined to each other by unnatural formations; and, when any of these have fleshy excrescences, all such admit only of an operative remedy which, though generally not difficult, cannot be undertaken by other than a person intimately acquainted with the anatomy of the implicated parts.

VI. Protrusion of the brain itself is not a very rare occurrence, in new-born children. It assumes two distinct forms;—in one, the skin, bones of the skull, and external membrane of the brain are wanting;—in the other there is an opening in the bones, but the integuments of the head remain entire. In cases of the first kind, it is manifest that unskilful interference must be mischievous:—the second has peculiar characters and is more

manageable. Imperfect closure of the fontanel, and other openings of the skull facilitate its formation:—it appears as a soft, rounded, undiscoloured tumour, having an even surface with its base circumscribed by the margins of the cranial bones and, in some instances, exhibiting distinct pulsations corresponding to those of the heart and arteries. When compressed, it disappears, but soon resumes its original dimensions. This disease, if tenderly treated, seldom becomes formidable:—rough interference, however, may occasion its being followed by the most distressing and fatal effects.

Such tumours of the brain are cured by keeping them steadily but lightly pressed down within the skull, till such time as the aperture in the bones shall be closed by their perfect ossification. For promoting this end, the swelling should be often cooled with a lotion of vinegar and nitre, and kept covered with a flat bag made of soft leather, or preferably of thin pliant bladder, filled with quicksilver and adapted to overlay all the parts. Before being applied, one of its surfaces ought to be spread with firm starch which will secure its adhering:—this can be washed off and renewed when the infant is dressed. Occasionally, a piece of thin sheet-lead covered with fine linen has been successfully employed for the same purpose:—it is sewed under the cap; and, by loosening or tightening this, the degree of compression can be lessened or increased. This method, however, is in some respects objectionable:—it exposes the child frequently to sustain an amount of pressure, by narrow tapes under the chin, equal to the weight of the lead, which moreover is hard and unyielding, and exceedingly susceptible of being displaced.

VII. Herniary swellings, or ruptures, originate in the

dislodgement of bowels from those boundaries within the belly where, in a state of health, they are naturally contained. They always protrude underneath the skin; have a smooth, equal surface; and are easily compressible, but instantly return to their former size on the pressure being withdrawn. Infants not seldom bring such tumours from their fœtal state:—those denominated umbilical and ventral may, under ordinary circumstances, have their treatment entrusted to popular discretion.

Umbilical ruptures have their site in the navel:—they occur more frequently than those of other places, and their remedies, when employed early, succeed without much difficulty in suppressing them; but, if neglected or large, their projecting substances are liable to sustain inflammatory excitement, and to destroy the child by degenerating into gangrene.

Various methods contribute to their removal:—besides the local applications, however, three objects demand particular attention,—that the child be assiduously prevented from crying,—that, if it have a cough, the causes of this be not allowed to remain,—and, that the bowels be carefully kept easy, but not too free, in their natural actions. With these not unimportant cares, aided by daily washing all the person in cool water for the purpose of bracing the general system, and by frequently, thrice a-day for instance, stuping the tumour with a cold infusion of galls or the bark of oak which tends to invigorate the cutaneous fibres by promoting their constriction and thickening, many swellings of this kind may be made to disappear. Firm pads, differently constructed and held on the navel with a common or elastic bandage, are usually employed with a similar intention:—but, from the difficulty of retaining these so as to deter-

mine a regular degree of compression on the tumour, and from their exercising pressure all round the body and thereby conducing to impede the development of internal organs, their advantages appear to be more than counterbalanced. Instead of these, if local applications be preferred, a little ball made of thin gauze filled with a fine powder, formed by rubbing minutely together equal parts of the best gum arabic and galls, will be found greatly more convenient as well as conducive to the ultimate end. This ball should have its surface slightly moistened with cold water before being placed on the depression made at the navel by gently repressing the bowels; and, for keeping it in this situation, the nurse may use a few strips of adhesive plaster crossing each other at the centre of the ball,—or one large piece of this preparation,—or a bit of soft leather covered with burgundy pitch,—or, what is best of all, a circular patch of thick old linen or flannel, about three inches in diameter, dipped in a strong solution of isinglass and applied while wet and warm:—at the same time, a thin waist-band, not tightly drawn, will secure the dressings from being disturbed.

Ventral ruptures constitute a less frequent variety of these protrusive swellings:—they occupy indiscriminately any region of the belly, but most commonly rise in its middle and at uncertain distances below the navel:—what remedies have been advised for discussing the last kind will act on these with equally beneficial influences.—Children often come into their infantile state with such tumours on other parts of their persons; but the treatment of these is more intricate, and consequently must be surgical.

VIII. Deformities of the fingers, toes, and feet are sometimes perfect at birth:—in other instances, they appear

to have then made very little progress; but this soon advances, as the infant grows, in consequence of the distorted joints having their muscular actions disbalanced. Among all these, the club-foot not the least unfrequently occurs:—it assumes two forms; one, presenting the soles turned inwards; another, where they are exhibited in the opposite direction. Both these states have been represented, in some writings, as capable of being easily remedied:—parents, however, by looking around them in society, will readily discover evidence of the great, the nearly insurmountable, difficulties opposed to the successful removal of this deformity. Instructed by the fact, therefore, they will perceive wisdom in submitting it timely to the best management:—the prospect of this proving beneficial is certainly proportioned to the earliness of its being employed.—Since the first ages of surgery, many ingenious machines have been contrived for the purpose of reducing the club-foot; but almost all of these, in being too complicated, have their necessarily limited usefulness still further impaired:—well-informed surgeons, however, are acquainted with a recent invention, the simplicity of which is obvious, and whose advantages obtain illustration from an increasing experience of its powers:—an interesting female, aged twenty-three years, was perfectly cured, in the space of twelve months, by a skilful direction of this instrument.

IX. Nature is often presumptuously accused of making the organic error which the appellation *Tongue-tied* expresses; and many a tender innocent is often doomed, in consequence, to undergo for an imaginary malformation the pain of a curative interference that might well be spared it, by the right exercise of parental judgment:—

infants truly tongue-tied very seldom come under observation.

Beneath the middle of the tongue is a thin delicate membrane destined, by attaching it to the lower jaw, to regulate and limit its motions, Sometimes, this membranous tie or *bridle* is prolonged to its very extremity and thus prevents it from executing with freedom all the various actions of which it is susceptible:—sometimes also the membrane's extent and disposition are such as to disqualify the infant from compressing the nipple with what force is necessary to exclude the external air and make the milk flow:—and, sometimes, it is only so lengthened as to occasion difficulty in speaking or in the pronunciation of certain words.

Incapacity of sucking is generally the first to draw attention; but this state may originate in various sources:—1st. In the lips and tongue being imperfectly susceptible of direction by the instinctive power, or in their having a defective supply of the proper muscular energy;—this will be remedied by supporting the young one's strength with artificial foods and frequent frictions of the spine with soft, dry flannel or the nurse's hand:—2d. In an increased secretion of viscid matter on the surfaces of the mouth to such an extent as shall embarrass, or even interrupt altogether, the tongue's motions by agglutinating it to the under jaw or the palate: this, as a cause of disability at suction, may be removed by separating the adherent tongue with the thin handle of a teaspoon or similar instrument, and then carefully washing all the parts with a weak milk-warm solution of honey and the subborate of soda in water, applied by means of a soft feather or hair-pencil, while care is taken that the child swallows as little as possible of this or any other medicine:—3d.

In smallness or want of excitability in the maternal or nurse's nipple: this is of unfrequent occurrence, and may in general be obviated, when it does have place, by exciting the nipple with applying an older child to suck it, and by fomenting the breast with tepid water or other mild fluid:—and 4th. In the tongue's being actually tied down so as to have its natural actions impeded: this, and for this only, the operation really becomes necessary.

When, therefore, its bridle visibly extends to the point of the tongue, and when the babe cannot seize the finger firmly with its lips and tongue, or suck the nipple of a woman whose milk is freely drawn by another infant, the membrane which causes this defect is to be divided so far as shall place the parts in their natural relations. This should be done by a single cut with smooth round-pointed scissars, and the incision made in a direction nearly parallel to the under jaw, for the purpose of avoiding the contiguous arteries and veins. When this minute operation is rightly performed, very little, if any blood escapes from the wound, and the child, instead of exhibiting signs of having experienced pain, often eagerly commences sucking. Should a blood-vessel be wounded and continue to bleed, the babe swallows the blood as it flows; and this, by its being lost from the system and accumulating in the stomach, eventually causes death. It is, therefore, most necessary that mothers frequently inspect the parts, for several hours, after such division of the membrane has been practised:—this bleeding may be suppressed by seizing and slightly squeezing the opened extremity of the vessel, for a minute, with the common dressing forceps of surgeons. When, moreover, the incision is carried too far back, the tongue gets liberated from its natural restraint, and thus becomes exposed to be

reverted back into the throat and, in this way, to cover the mouth of the wind-pipe and produce suffocation. Such a misfortune may be dreaded, when the young one suddenly becomes agitated, grows livid in the face, and sustains convulsive shakings:—on these symptoms appearing the mouth ought to be instantly examined, and the tongue drawn into its proper situation by a finger of the nurse, or the handle of a teaspoon; and, after this, the breast should be given, which causes the tongue to be stretched forward to embrace the nipple, and thereby prevents a recurrence of this alarming and, if neglected, necessarily fatal accident.

X. Hare-lip may occur in either or in both lips; but most frequently has place in the upper:—it is sometimes double, and occasionally accompanied with a defect in the structure of the palate. It can only be remedied by a nice operation, which no one but an experienced and dexterous surgeon ought to undertake.—As the nature and extent of this deformity can be easily perceived, more does not appear to be necessary here, than merely to inform parents what is the proper period when the indicated operation should be performed.

During its infantine state, all the energies of life are exercised in providing for the young one's general growth and for the development of its first teeth:—it is then also exceedingly susceptible of external impressions, and liable to suffer essentially from the effects of whatever causes, such as pain or fear, may tend to excite the nervous system and thereby disorder the sanguineous and digestive functions, from which necessarily result very great derangements of health. So long, moreover, as the teeth of children are forming, they often continue subject to indigestion and irregularities of the bowels, to errors in the

blood's distribution, and to a variety of convulsive affections, all which the operation for hare-lip has a manifest tendency to promote or aggravate. At any time, therefore, after the primary dentition has favourably terminated, if the child is vigorous, desires and digests food, sleeps well, and remains quite free of all the eruptive diseases, it may be submitted to this operation with the best prospect of success;—because, at this time, nature begins augmenting the youthful forces for enabling them to complete the second teething, and a proportion of these forces may now be employed in perfecting that process in the lip which the surgeon shall have prepared for being influenced by their regenerative action.

XI. Hæmorrhage from the unclosed vessels in the navel not unfrequently supervenes during the first days of infancy. It is of two kinds:—the one from a vein or artery which had never been obliterated; the other, from vessels re-opened by destruction of their integuments.—Filling the navel with a soft pledget impregnated with a solution of alum or the infusion of oak-bark, frequently renewed, and retained in its place by a fine compress and bandage, will be adequate to a cure of the former kind. The latter is usually connected with a defect in the constitutional health, which should yield to the appropriate remedies:—in the mean time, the parts require being treated with such applications as shall conduce in keeping them pure and in restoring their salutary actions:—placing on the sore a piece of lint or caddice charged with a fine powder combining equal parts of gum arabic, catechu or kino, and galls, minutely rubbed together in a mortar will restrain the effusion of blood and be favourable to the formation of a new surface. This application may be covered by several circular patches of

adhesive plaster, each being progressively larger than what precedes it, and the whole made secure by a bandage:—such a dressing may be renewed when so moistened as to become ineffective; but this will seldom be required:—it exerts a threefold influence on the disease,—by constricting and ultimately closing the bleeding vessels,—by compressing and strengthening the flaccid textures,—and by excluding the atmospheric air which naturally irritates living structure when denuded of its cuticle. The circumvesting bandage should be broad and soft, and not too tightly drawn.

XII. Ulceration of the navel, when slight, will heal in a short time under the use of poultices, made of jellied arrow-root, a considerable proportion of honey, and a few grains of alum, applied at least twice in the day, after the sore has been well cleansed and exposed as short a space as possible to the external air. Ulcers of this kind sometimes extend so far as to induce a degree of irritation which is prejudicial to the infant's general health; and, in a few instances, they have degenerated into true mortifications that, for the most part, had fatal results. In either case, the prudence of parents independently of their affection, will lead them to have the treatment of such important disorders conducted by professional advice.

XIII. Sometimes, also, that portion of the navel-string which is behind the ligature does not shrivel after the natural manner, but continues to live and protrude so as to become, when neglected, a source of inconvenience as well as of disease. This unusual state generally occurs in healthy children, and results from an excess of their organic energies. By tying it loosely nearer the base, washing it three times in the day with a weak tincture

of galls, and gradually tightening the ligature, it may be made ultimately to shrink, when the parts throw off the intercepted portion, and go into their natural form.

XIV. Warts on the hands, fingers, and necks of children, except when improperly treated, are seldom painful:—removal of them is desired only because of their forming an inconvenience or being regarded as a deformity.—When low, broad, and flat, or very large with a thick base, they will yield to a course of warm softening applications:—these may be poultices formed of arrow-root, isinglass, and honey, hotter than the skin and frequently changed; and their effects will be promoted by slightly smearing each wart with antimonial ointment before the poultice is applied. Such as are high or have a narrow neck can be easily and effectually removed by tying them with a ligature formed of silk thread:—when destroyed in this way, they do not so readily return. Warts should never be cut with sharp instruments, because the subsequent bleeding increases the vital activity of the roots and accelerates as well as augments their new growth:—and, although caustic applications sometimes promote their removal, these ought on no account to be applied to warts situated on the lips, eyelids, or any of the joints.

XV. Small whitish tumours resembling warts often arise on the neck, face, and head, especially of children, during the progress of dentition:—they are mere suppurations of the little glands of the skin; and, although they frequently fall off and re-appear, may be finally exterminated by squeezing out the suet-like matter they contain and then rubbing the parts, rather roughly, with a fine powder consisting of gum arabic and refined sugar, in equal parts:—this excites the adjoining nerves and blood-ves-

sels, and leads to the rejection of that film which includes the white substance on whose presence these excrescences depend.

XVI. Corns growing under the nails, on the toes, joints, and other parts of the feet, not unfrequently distress the young as well as adult persons:—they invariably result from compression; and, when the cause of this is removed, they usually die away. When inveterate, they occasion uneasiness and sometimes even intense pain:—this will be mitigated by fomenting them often with very hot water and paring their surfaces as deep as may be without causing them to bleed; after which they may be slightly smeared with olive-oil and have about two grains of finely powdered opium sprinkled on each corn, and a poultice made by rubbing a bit of alum in the white of an egg, or one consisting purely of animal jelly, applied during the night. They disappear under the use of a paste made of isinglass, gum arabic, finely powdered galls, and tartrite of antimony, renewed every night and morning:—but, in whatever way they are treated, it is indispensably necessary that pressure, in every degree, be withdrawn from the parts in which the corns are situated.

XVII. Some infants, in a few days after being born, have their nipples filled with a whitish fluid resembling milk, which it is too often the custom to evacuate by squeezing these delicate and excitable parts. This, which is merely a turbid serous secretion, when the breast is kept dry and left undisturbed, most generally disappears by means of local absorption. If, however, its resolution be not determined by this natural process, it may be induced by frequently washing the nipples with spirit of nitrous ether diluted according to the effects, and in the intervals de-

fending them from moisture and cold with a bit of soft lint or carded cotton. When they burst or are opened, nothing more is required for their healing than to cleanse them once only in the day with a very weak tepid solution of alum and refined sugar; and, when well dried, to cover them with a common white wafer made to adhere by moistening it in the usual manner.

XVIII. Young females, particularly the daughters of scrofulous parents, occasionally suffer from a kind of tumour which forms in the breast, about the time when their childhood is terminating. These tumours have a tendency to create unpleasant apprehensions; but they very seldom give rise to unfavourable results:—they are often, however, exceedingly painful, and deep-seated. In some, they present a rough and jagged; in others, a smooth surface:—sometimes they are loose, sometimes fixed. They form around and behind the nipple, and are attended with a constant sense of heat and stinging pains which pressure or other excitement of the breast is prone to aggravate.—When the constitutional health is moderate, they require no farther interference than simply guarding them from being compressed, and fomenting all the chest, as may be desirable, with warm milk or whey:—nature, in due time, will provide for their ultimate removal. Should the health, however, be defective, it ought to be with the least delay repaired by the exhibition of appropriate remedies:—many local affections derive their peculiarities from a constitutional origin. In a few rare instances, they have suppurated:—when this occurs, it is sufficient to wash the sores twice each day with warm rose-water, to cover them with any soft ointment, and to expose them as little as possible to the influences of atmospheric air:—and, if the digestive organs

be active, a liberal diet and exercise will contribute to their being permanently healed,

XIX. Chilblains are produced by sudden exposure of the parts, generally the fingers or heels, to heat, after being deeply affected by the actions of cold and moisture. Such children as seem naturally liable to be afflicted with this distressing complaint, should be attentively guarded from the influence of its causes. Wearing soft warm leather gloves, lined with oiled silk, secures the hands; socks of a similar structure, used under the stockings, protect the feet from its effects, which are frequently as tedious as they are painful.

When heat, itching, swelling, and redness constitute the only symptoms, they may be removed by applying to the parts a poultice made of linseed-meal stirred into vinegar holding about a teaspoonful of nitre in solution:—on this, a few grains of mustard may be sprinkled, and the young sufferer put to bed, when a sound sleep generally ensues. In cases where the seizure is mild, it yields to one application of this remedy which, however, may be renewed as circumstances proceed:—in the intervals, after being well dried, the diseased parts should be thickly wrapped in carded cotton, if remaining in bed; or, if otherwise, a bandage of oiled silk proves a convenient and proper substitute.

Chilblains, particularly when the young one's health is not vigorous, sometimes lead to large abrasions of the cuticle which, if mismanaged, tend naturally to form indolent ulcers and, not unfrequently, go into gangrenous sores. The simple abrasion may be cured by washing it, morning and evening, with a lotion of nitric acid very largely diluted with rose-water, followed by dressings of the soap plaster, or spermaceti ointment, which an oiled

silk, or chamois-leather bandage will retain in their place. Similar washings, cold or hot as may be suitable, promote the healing of such ulcerations; but, instead of the soap and spermaceti, the compound elemi ointment will be advantageously substituted. Yeast poultices, alternated with astringent or stimulating, and cleansing lotions retard the progress of gangrened chilblains; but the arrangement of their various modifications, and of the internal medicines requisite for invigorating the general system cannot be safely entrusted to other than scientific management.

XX. Scalds and burns become a frequent source of suffering to children. When, therefore, such a person has sustained an accident of this kind, what treatment of the injury shall be most appropriate, will be determined by the constitutional peculiarities of the sufferer, and the degree in which the parts have been injured:—vigorous and florid children, endowed with the best energies of life and enjoying full health, require cooling and astringent applications; those who are thin, pale, nervous, or enfeebled, recover soonest under the use of remedies having mild and emollient qualities:—and, if the cuticle remains entire, a covering is not at first necessary; but when abrasion has place, the sore must be securely protected from the atmospheric influence.

Agreeably to this rule, then, on a young one with the first of these personal characters being scalded, the parts should be instantly immersed in cold water, till such time as a proper vessel, a small *watering can* having the rose or cap of its spout perforated with holes for instance, can be obtained and filled with vinegar either simple or having a large proportion of nitre dissolved in it, or with brandy, whisky, or diluted spirit of nitrous ether. The parts are

now to be held over an open vessel while the fluid is slowly poured on them, from such a height as can be borne, and the stream, supplied by replacing the fluid, should be continued without interruption so long as pain shall be felt. If, during this process, one or more vesicles arise, each of them is to be punctured with a fine needle and, on the lymph being evacuated, the cuticle pressed down on the subjacent structure:—this may be repeated so often as necessary; and, in the end, a large poultice formed of bread or linseed-meal and the liquor already used for a lotion, will produce very soothing effects and afford the best protection from every external cause of irritation. Subsequently, the dressings will be simple as for a slight or blistered sore.—When, on the other hand, a person having an excitable temperament suffers a similar injury, the same affusions and dressings are applicable; but they require being heated several degrees above the body's natural temperature. In both ways, the remedies act on the parts, by the mechanical influences of their weight,—by their chemical effects on sentient texture,—by admitting a moderate and gradual evaporation from the surface,—by restraining, in the former, an excitement and undue ascendancy of the sanguineous system which necessarily tends to inflammation,—and, in the latter, by soothing and subduing irritability of the nerves and thus preventing or lessening the disturbance it is liable to induce.

Slight abrasions of the scarf-skin admit of being similarly treated; but, when they are numerous and extensive or deep, their being defended from the action of external air contributes materially in mitigating pain and in guarding them from degenerating into malignant ulcers. This is done best by immediately putting the

scalded parts under water, cold or heated according to the distinction already defined, and retaining them so immersed till a large poultice shall be prepared:—it may consist of bread, pease-meal, potatoe-starch, arrow-root, or flour of linseed, and vinegar as used for the lotions, warm or otherwise, containing a small proportion of alum, for the purpose of increasing its astringent effects. Meal of peas or linseed stirred into the soft soap of lime so as to make a paste of moderate consistence; or a thick but soft composition formed by rubbing minutely together prepared carbonate of lime or precipitated chalk in whites of eggs till the mass be suitably firm, is likewise very efficacious in such cases; and much advantage ensues from sprinkling thinly over the sore a fine powder having opium and kino in equal parts, just before the acid or soapy poultice is applied. Whichsoever of these shall be preferred, it may be renewed as often as necessary till the intense pain have subsided, when dressings with the elemi ointment, assisted occasionally by a common poultice if the ulcers become irritable, will promote the efforts of nature in bringing their treatment to a favourable termination.

Burns and lesions resulting from them do not necessarily require having applications different from what are recommended for scalds and the consequent sores. Many apparently dissimilar remedies produce, in such cases, the very same effects:—those here preferred are simple and convenient:—they succeed as well as any other, and better than most applications employed with a like design.—Extensive injuries arising from such sources, however, especially when they affect the general system by exciting the fever of inflammation, do not readily prosper under popular management.

XXI. Marks and spots, differing in kind, form, and colour, occasionally accompany the foetal growth of children, and continue after birth to disfigure various parts indiscriminately of their persons. Such discolorations, in some instances, can be obliterated:—for the most part, however, they resist every contrivance for their removal. Their existence, as anomalies in the economy of animated nature, is indisputable:—concerning the mode only of their production has any question been entertained;—but, the ascribing to them other for their originative cause than the mother's imagination, would be an offering of outrage to popular wisdom. Prudent matrons should never admit either doubt or disbelief of this exquisite conception; it may be available in securing, from all tender husbands, a ready compliance with their amiable desires:—and, as for the benevolent doctors, they dare not dispute with ladies on so nice a subject, without incurring the danger of drawing imputations unfavourable to their gallantry:—but, to those who investigate truth in the study of nature and philosophy, this question constitutes a most important object of reflection and research.

Reason and observation, then, have led such inquirers to the conclusion that a mother's imagination, merely as the faculty which represents ideal pictures, does not act as the producing cause of disfigurative blemishes on any part of her infant's person. Throughout the wide extent of human experience, indeed, there is not a single fact having tendency to shew that of itself the maternal imagination has really generated such effects; and, consequently, till something of this kind shall be discovered, the referring them to other sources, though these sources may not be defined precisely, must be regarded as legitimate philosophy. If, however, the imaginative power be

incapable of determining these results, others more important and affective are well known to be occasioned by the intensities of mental emotion:—by exciting spasmodic constrictions in the organ containing it, they often hurry the unripe being prematurely through the last stages of its foetal existence, and also not unfrequently produce dislocations of the joints, fractures of bones, imperfections or lesions of structure, deformities and distortions of the person and its members, and many of the disorders and diseases which the new one brings with it into the infantile state.—Let mothers, then, be instructed solicitously to guard against the impressions of whatever may have a tendency to excite in themselves any sudden or vehement disturbances of mind; because these may injure the organic or intellectual nature of their coming offspring:—and, at the same time, let them banish for ever, every apprehension of the possibility of their expected progeny being exposed to bear the effects of any capricious or unwelcome fancy on which, for a brief period, they may be seduced to ruminate.

Flesh-marks or rednesses of the surface, resembling the stains of ripe fruit, occur more frequently than any other of these discolorations. They proceed from clusters of blood-vessels whose actions change the natural structure of the parts. Usually, they remain level with the skin:—then, except as deformities, they are quite inoffensive and should be exempted from interference. Not seldom, however, they constitute remarkable excrescences having a disposition to admit of gradual or even rapid enlargement:—sometimes, in the end, they burst and give issue to excessive and very debilitating discharges of blood. Whether, therefore, they be merely superficial spots, firm morbid elevations with groups of thick interwreathed

veins, soft indolent violet-coloured tumours, purplish granulated swellings, pale irregular risings covered with white delicate skin, or even simple moles, they are very liable to be exasperated by the influences of inappropriate applications. Whatever, as friction, compression or a bruise, has the effect of exciting their own or the neighbouring nerves; or of hurrying the actions of their blood-vessels; or of occasioning, in any way, their being stimulated by an excess of living blood, contains a direct tendency to accelerate their growth and make them the seat of uneasy or painful feeling. When parents, therefore, shall have decided on attempting the removal of congenital marks, of the simplest kind only, from the person of a child, they may expect the greatest degree of success from employing such applications as seem best qualified, without irritating their sentient fibres, to produce the constriction or even the obliteration of the vessels which nourish the discoloured parts. For this purpose, small poultices made by rubbing alum, with a little nitre, into the white of an egg, or of jellied arrow-root or salep thickened with the finest powder of galls; or preferably, a paste or wafer or lozenge composed of isinglass, gum-arabic, and the last mentioned powder or that of dried whortleberry-leaves, will determine the indicated effects as well as any other preparation possessing the astringent powers.—When flesh-marks originally are, or subsequently become tumours requiring extirpation, this ought never to be essayed by other means than the surgeon's knife:—caustics and cauteries are cruel and uncertain, and cannot be used in such cases without exciting disturbance in almost all the vital functions:—if they burst and bleed much, they will demand the best attentions of skill and experience.

XXIII. Squinting may be retraced to three principal sources:—to misplacement of the eye, or irregularity or defect of its organization:—to weakness of the affected eye which is thus prevented from associating with its fellow in the same acts of vision:—and, to the vitiated habit of using one eye while the other is left in a state of comparative inaction, and thereby rendered gradually inobedient to the mind's control.

Instinct governs all the desires and actions of children for an indefinite period subsequent to their birth:—during that period, therefore, there can be no certainty of any infant's having a disposition to squint; and, of course, the remedy will be unnecessarily, if not injuriously, applied. So soon, however, as parents shall perceive a tendency to the practice of oblique vision in a young one capable of distinguishing appearances, they should take immediate measures for its being invariably so placed, whether in bed or the nurse's arms, as to admit the light coming on the squinting eye at the side from which it is turned; and also, to take much pains in exhibiting attractive objects immediately before its face or in such a way as shall assist in counteracting the eye's irregular direction.

Should such means, however, prove unavailing, as in most cases they do, it will be requisite to ascertain on which of its three originative sources the deformity depends:—if, on the first, it is incurable; when, on the second, particular tonic and stimulating applications directed by science sometimes, but seldom, procure its being remedied; and if, on the last, it may yield to one or other of the various mechanical inventions recommended for its cure. Goggles, for such a purpose, are worse than useless; and the affixing bright objects near the orbit with a view to their catching the pupil and withdrawing it from

its morbid direction, is little better:—the former is a hurtful, the latter a puerile contrivance. Greatly preferable to either is the method of blindfolding the sound eye, with what is called a *blink*, for a considerable part of every day:—this forces the affected one into use and a subserviency to the will.

XXIV. Children are more exposed to have bleedings from the nose than persons in mature life:—they proceed from the abundant supply of blood sent, during the first epochs of existence, to all parts of the head, and from the peculiar delicacy of the net-work of vessels expanded, for the use of the olfactory sense, over the internal surface of the nostrils, and covered only with thin integuments:—their immediate cause is the bursting of an artery or vein by reason of its own weakness, or of the blood's quantity or force.

When hæmorrhage from the nostrils is preceded by local heat and itching, flushing of the face, ringing in the ears, throbbing of the temporal arteries, with a pain or sense of fulness in the head, it will often afford a more effectual relief than bleeding in any other way, and should not be restrained till it has answered its purpose. Small portions of blood, not more than an ounce, have sometimes, when evacuated spontaneously, produced great freedom and elasticity to an oppressed head; and, when more copious, prevented an apoplectic seizure or inflammation of the brain. Should the preceding symptoms not exist, however, it is proper that such discharges be checked by astringent applications. For this purpose, a large poultice of meal or flour and vinegar holding nitre in solution, may be laid on the neck, back and shoulders, or on the very lowest part of the body and between the limbs, and renewed so often as its coldness subsides. Unexpected

and complete immersion in cold water, pouring it on the head from a height, or the shower-bath, but more particularly the first of these three measures, not unfrequently stop a flow of blood from the nose:—even putting the feet and limbs in warm water and gradually increasing its heat will, in some constitutions, determine the same effects. Injection of astringent liquids into the nostrils by means of a syringe seldom proves useful; because it washes away the clots of blood which might serve to allay the hæmorrhage:—and, unless placed in contact with the orifices of the bleeding vessels, the introduction of styptics in a solid form cannot do good and are always unpleasant. When such are desired, however, pieces of dry sponge or scraped linen; charged with the finest powder of kino or galls or whortleberry-leaves and gum-arabic with nitre, or a bit of soft new-baked roll made into a paste with either of these ingredients, may be cautiously inserted into the nostrils and left there to act on the ruptured blood-vessels by its chemical and mechanic powers. Repeated draughts of cold water impregnated with muriatic acid, as may be agreeable, are efficacious auxiliaries to external remedies or the efforts of nature, in restraining the more common kinds of nasal hæmorrhage.

XXV. Many young persons are distressed by the pains of true tooth-ache, by the effects of nervous irritability in the gums, by their inflammation, and not seldom by ulceration of these sensitive parts.

When the affected tooth contains a hole, it should be stuffed with some substance that shall remain for several days at least, and thus prevent the external air and foods from irritating the central nerve. For this end, the aperture should be filled,—first, with one or more drops of a thick warm solution of isinglass or gum-arabic,—and

then, with gold-foil very firmly impacted:—or, what is preferable, a soft paste made of the mortar used by stone-masons for cementing buildings under water, may be carefully inserted into the hole with any fit instrument, when it will adhere intimately to all sides of the cavity, and soon harden so as to become an indissoluble mass which no moisture of the mouth shall be able to soften or dislodge. Temporary relief is occasionally derived from dropping into the opening of the tooth a globule of some hot essential oil, as that of cajeput, peppermint or nutmeg, and confining it with a glutinous plug formed by minutely mixing the powders of fine opium and dried birdlime, in equal parts, and adding the requisite proportion of cinnamon or rose water. In aid of either of these applications, the contiguous parts of the jaw, internal and external, should be well rubbed with a piece of soft flannel placed on the finger and impregnated with some rectified oil of amber. Intense paroxysms of tooth-ache are sometimes perfectly allayed by the person taking a smart emetic, bathing the feet, retiring to bed, and placing the affected cheek on a small pillow made of thin soft muslin and filled with heated hops. Sound sleep and a gentle perspiration commonly ensue, and the patient awakes surprisingly relieved.

Nervous irritability of the gums yields sometimes to frictions with the warm volatile oils, or the tinctures of opium and capsicum in equal parts, or to hot firm poultices formed of flour with a little opium, mustard and ipecacuan, or when obstinate to a small blister behind the ear:—the influences of all such remedies are materially promoted by the exhibition of an active emetic.—Large poultices on the cheek and side of the neck serve to allay inflammation of the jaw, when it is moderate:—they

should be warm or cold, according to the individual's temperament; and two emetics at least will conduce much to the disease's speedy removal. Sometimes, in such cases, there is a necessity for applying one or more leeches to the inflamed gum, but this resource should never be unadvisedly employed. Before children have obtained their second set of teeth, it is more than doubtful whether any *particular* benefit they may derive from the abstraction of blood by leeches or otherwise, for the cure of disease, be not in a great measure counterbalanced by the *general* deterioration even a small loss of this vital fluid occasions in the system.—When ulceration of the gum is caused by the spiky fragments of a decayed tooth, it will subside when these are removed:—when it proceeds from defect of the constitution or of the local organization, the former must be repaired by suitable treatment; the latter generally yields to cleansing and bracing applications:—these, among others, may be tincture of myrrh holding honey in solution; or white vitriol dissolved in equal parts of rose-water and simple syrup; or rhubarb-wine; or a vinous infusion of oak-bark, kino, or leaves of the whortle-berry to which a large proportion of sugar should be added:—and, they prove most advantageous when used just before going to bed and after meals, on the mouth being previously washed in the usual manner.

XXVI. Ear-ache, in children, may proceed from the irritation of a decaying tooth; or the presence of an insect, pea, fruit-stone, or other extraneous substance in the ear; and it is sometimes nervous or inflammatory.—When pain in the tooth is removed, that of the ear generally soon subsides:—should it remain, however, a little heated milk or oil, or melted fresh butter should be poured into the ear and confined there by placing a large warm poul-

tice over the cheek, neck, and all the side of the head. On observing that a child complains much of pain in the ear without an obvious cause, the parent should make a close examination of the parts; and, on finding that it proceeds from a pea or similar body, must have recourse to the surgeon for its immediate removal. Insects that have penetrated into the opening of the ear are readily destroyed by a few drops of spirit of turpentine or any of the more active essential oils.

When the ear-ache is nervous and moderate, it often ceases on having the parts washed a few times with warm milk or other bland fluid, and defended from the external air with a pledget of wool or the caddice of silk:—should it be intense, however, the neck, cheek and parts behind the ear must be strongly rubbed with rectified oil of amber, the entrance into the ear filled with palm-oil or cerate of spermaceti having some powdered opium sprinkled on it, and the whole side of the head and neighbouring surface covered with a poultice as hot as can be endured. Sometimes, in such cases, it is the best practice to exhibit and even to repeat a mild emetic which itself, without the aid of other remedies, will be sufficient for the cure of a severe nervous ear-ache.

Inflammatory ear-ache generally results from the irritation of extraneous or acrid substances in the ear, or from exposure to cold. Immersing the feet or lower half of the body in warm water, filling the parts frequently with heated syrup containing some powdered opium, and applying a succession of large hot relaxing poultices to the affected side of the head, cure the disease in its simple state:—should it, however, resist these means, the aid of science becomes indispensable.

XXVII. Temporary deafness proceeds from the effects

of inflammatory action, induration of wax in the ear, or from the general impressions of cold.—When, in the two first of these instances, keeping the parts secure from the influences of external air, and injecting warm oily or watery fluids with a syringe, aided by mild opening medicine, fail of removing the symptoms, the farther proceedings, to be safe, must be surgical. Cases originating in the last cause, yield to smart friction of warm camphorated oil on the surfaces surrounding the ear, covering all the neck and side of the head, with hot poultices, relieving the bowels and skin, bathing the feet, and taking one or more emetics as the occasion shall require.

XXVIII. Excoriations behind the ears of children result from inattention to cleanliness, from the irritation of difficult teething, or from a defect in the general system. Washing the simpler kinds, twice a-day with warm rose-water or a solution of kino in hot milk, and placing over them, when dried, a piece of charpie charged with finely powdered charcoal or the oxide or carbonate of zinc, readily procures their healing. When they become spreading or deep sores, there will be advantage in covering them with the alum-poultice, after using the former lotions:—but, on their growing dark and foetid, the parents in the absence of regular advice, may cleanse them with a watery solution of kino or the oak-bark and, in the intervals, employ the fermenting poultice at a temperature some degrees above that of animal heat. If there is certainty of these lesions being connected with the disorders occasioned by teething, any attempt at healing them will be an act of resistance to the efforts of nature at preserving the constitution:—let them then only be kept pure, and when their causes cease to operate, they themselves will disappear. Such excoriations

as depend on failing of the healthy functions, do not continue after the vital energies have been revived.

XXIX. Boils almost always have connection with disorder of the digestive organs, and can seldom be interrupted in their course by external applications. On their very first appearance, an active emetic may be exhibited, and its effects promoted by another after an interval of not more than twelve hours. At the same time, no food whatever, and very little drink, ought to be taken so long as the attempt at preventing the formation of a boil is continued. In an hour after the last emetic has operated, the young sufferer should be put into a warm bath and after being well rubbed with a rough cloth, have a large cooling poultice fixed on the part, and placed in bed, when the sleep that follows must not if possible be disturbed. These measures need not be prolonged beyond thirty-six hours unless symptoms of their beginning to determine beneficial effects shall appear.

In by far the greater number of these local inflammations, however, it is preferable to accelerate their natural progress; and, for this purpose, the child must be allowed free draughts of warm animating drinks to which a little sherry-wine may be added. Large warm poultices, each containing a table-spoonful of strong whisky, should be laid on the growing boil and frequently renewed:—the extent of their usefulness is always proportioned to the degree of their heat and moisture. Moistening the centre of the suppurating parts, moreover, with a saturated solution of the sulphate of copper, at each application of a fresh poultice, hastens the tumour's ripening and promotes its being spontaneously evacuated through an ample orifice. Boils sometimes, but not often, require being punctured with a lancet:—in such cases, it is always best

to make a free opening. If the purulent matter has been contained in a filmy capsule, the sore never heals till this has been entirely removed:—poultices, and mild ointments with a bandage, form the simplest and best dressings for assisting nature in regenerating the lesioned parts.

XXX. Superficial whitlow of the fingers or toes proves a frequent source of distress to children of a particular temperament. Immediately on the first appearance of its supervening, the painful parts should be covered with an alum-poultice having some grains of opium sprinkled on it, and heated to such a degree of temperature as attention to the rule defined in a former section, shall direct. At the same time, a low cooling diet, as arrow-root containing phosphate of soda and nitre to an extent that does not make the food distasteful, will conduce to the general end. If the tongue is white or in any way loaded, an emetic should be forthwith exhibited:—it will clear and invigorate the digestive organs, relax the surface, and thus tend to intercept the farther development of the local disease. When it advances, frequent warm poulticings and paring the nail should constitute the sole treatment:—when, moreover, the swelling bursts and soft red flesh rises through the opening, neither burnt alum nor any other caustic, as is often done, ought to be applied to it; because this is not *proud* flesh, and such things unnecessarily increase the pain and retard the cure. Poultices contribute more effectually than any other remedy to soothe the parts and allay their irritation:—they also relax the firm skin which compresses the delicate textures underneath it, so as to cause their protruding through the superficial aperture and, from their softness and redness, being mistaken for unhealthy structure. Few of the circumscribed affections are so perplexing

and unmanageable as the deep-seated whitlow:—when early and rightly treated, its course may be shortened and its effects made less dangerous and excruciating:—the prudence of parents, therefore, will be approved by their resigning it implicitly to the management of a surgeon whose firmness and experience cannot be questioned.

XXXI. Stye originates from the lodgement of imperfectly digested substances in the stomach or bowels. Its very first symptoms ought to be attacked by the exhibition of an emetic, for the purpose of expelling its first causes, of agitating the whole system, of relaxing the eyelids and relieving their vessels by a copious emission of tears. If one or two emetics fail of repelling an incipient stye, all other attempts should be renounced as fruitless, and its maturity hastened by hot poultices of arrow-root or starch, renewed at short intervals till the pimple or tumour burst and its contents be spontaneously discharged.

XXXII. Within a fortnight after birth, some children become affected with a form of sore eyes, having particular characters. Occasionally, it is accompanied with eruptions on the head and various parts of the body, and sometimes with the signs of a scrofulous constitution:—most frequently, however, it is altogether unconnected with any other disease. Notwithstanding it often prevails in certain seasons of some years more than of others, and thus may seem to have relation with a peculiar state of the atmosphere as a predisposing cause; yet it most commonly results from exposure to cold. However mild its primary symptoms may be, they always require attention, because in many instances their subsequent progress is very rapid and alarming. From having, at first, only a slight degree of redness, the eye-lids suddenly swell and

enlarge to such a size that it is difficult to separate them without occasioning intense pain. By and by, this state is followed by a discharge of yellow purulent fluid which, on the lids being opened, is found covering the entire globe of the eye:—at the same time, the forcible pressure of the eye-lids against each other causes their being greatly thickened and not unfrequently everted. In severe and tedious cases, the eye-ball itself sustains ulceration; and, when the symptoms are exquisite, vision incurs the danger of being destroyed.

Whether they be caused by sneezing, laughing, or crying, a copious flow of tears seems to be requisite to a healthy condition of the eye-lids, in children. When obstruction, therefore, of the vessels that convey these tears has been induced by any means, the vessels themselves necessarily become loaded with the confined fluid and sometimes, from this excitement, undergo a degree of inflammatory action which may terminate in suppuration and the discharge of purulent matter. In this originates the ophthalmia of infants, now under consideration. Delicate as their young organs long continue to be, they are not the less exquisite, not the less susceptible of extrinsic impressions. Mellow heat expands all their systems; cold forces these occasionally to experience an obstinate constriction. This accounts for the readiness wherewith their eye-lids and the vehicles of their tears, suffer so much and so readily from the interruption of their functions. These parts, as well as all the person, are intenerated by the genial warmth of the mother's bosom, and their abrupt exposure to cold air or water, in this state of relaxation, makes them most liable to be seized with the disease whose progress has been described.

Such being the nature of infantine ophthalmia, its cure

must necessarily consist in the application of remedies adapted to remove constriction from the vessels of the eye-lids and procure their being relieved from distension and excitement by evacuation of the fluid they contain. For this purpose and so soon as redness and fulness are observed in the eye-lids of infants, a course of warm effervescing poultices to the affected parts should immediately be commenced and have their efficacy promoted by the addition of a little alum or the finest powder of whortleberry leaves. At the same time, the state of the eye must be frequently and intimately examined; and, so often as any fluid, watery or purulent, is found between or underneath the eyelids, it should be carefully removed by a fine hair-pencil well moistened with tepid rose-water, or preferably with the mother's milk. At each of these dressings, the edge of the lids ought to be gently pressed; and, after being dried, have the poultices replaced. When small ulcers form on the eye-ball, they generally yield to the same washes similarly applied. Infants, in such circumstances, should never be amused or laid to rest or sleep on their backs, but alternately on either side:—this position favours the descent of any discharge from the eye and its removal with a soft cloth or hair-pencil so soon as it is perceived. Should these means, as they undoubtedly will in a few instances, prove insufficient for the cure of this distressing malady, it must then pass from under the parental management. In all its stages, cleansing and softening, combined with moderately strengthening applications, contribute most to the assistance of nature in rebalancing the local actions. There is great cruelty in treating it with spiritous, caustic, and other exasperating remedies:—these are liable to induce fever and other disorders of the circulation by the

excitement of intolerable pain with the consequent writhing and crying:—and, by confining in the eye-lids what ought to be expelled, they directly counteract the exertions of the system in extricating itself from influences unfavourable to its general and particular health.—Such, then, is a sketch of the chief topical affections to which the peculiarities of childhood render it exposed.

ABDOMINAL DISEASES.

INFANCY and childhood, by reason of circumstances inseparable from these states, are frequently imbittered by the sufferings which accrue from a variety of diseases whose primary influences affect some organ or part situated within the abdominal cavity:—not the least remarkable among these, are such as originate in the ravages of intestinal worms.

I. Such animals, then, do frequently injure, sometimes destroy, the young constitution. They are of different kinds:—the long, round, and tape worms range indiscriminately throughout every part of the alvine canal;—those that are small, white, and thread-like, generally infest only its inferior extremity.

When worms constitute the originative source of ill health in a child, their presence is indicated by particular symptoms:—of these, the chief may be, inappetency or sometimes inordinate desire of food; sleeplessness, moanings, disturbed dreams, startings and grinding of the teeth in sleep; convulsive and nervous agitations when awake; paleness of the countenance; head-ache, irritation of the nostrils, fœtid breath, a teasing cough, with excess of viscid phlegm in the mouth which an infant is prone to swallow; gnawing pain in the stomach and a

distressing sense of faintness; gripings and enlargement with hardness of the belly; offensive, mucous and filmy dejections; and an intolerable itching at the external termination of the bowels, with great weakness and emaciation of all the person.—What remedies are adequate to their expulsion, produce this effect by the communication of general or specific influences.

Two particular objects require attention in every attempt at freeing children from the effects of what irritations, disorders and diseases arise from this origin:—that of invigorating the digestive organs *particularly* and the whole system itself *generally*, when they are impaired, by means of proper exercise, fresh air, frequent friction of the spine and all the abdominal regions with stimulating and bracing applications either heated or cold, or the same substances administered in poultices, assisted by the internal use of purifying and tonic medicines:—and that of exposing the noxious animals to the action of vermifuge remedies, by largely unloading the bowels with laxatives before the former are exhibited.—Both those intentions may sometimes be simultaneously pursued; but, when the child is much debilitated, the former must be held as the most important.—After such preparation, various articles will determine nearly similar results:—on the more appropriate of these, some observations may be acceptable.

Sucking children rarely have their bowels offended by the presence of worms:—hence, it seems deducible that these parasitic animals do not begin infesting the alvine canal, till after the epoch of infancy has considerably advanced. This circumstance, therefore, suggests an idea which may be made an advantageous guide in selecting the means of procuring their expulsion:—milk of the hu-

man female, then, is not only the best preventive of their development; but, when exhibited in sufficient quantity to growing persons, will act with much certainty in accelerating the dislodgement of intestinal worms.

Milk of the ass, also, conduces to the same ends. Under a regular course of this nutritive fluid, infants who have been much emaciated and pass shreds of worms in their dejections, soon begin gaining strength and vigour, and their morbid symptoms gradually disappear. Its efficacy may be increased, in many instances, by a suitable addition of sherry or other light wine. More serviceable, however, than either of the former is milk yielded by the mare. The tape-worm, in particular, has a strong antipathy to this fluid; and, on being exposed to its action, either quits the intestines alive in a few days, or dies and is expelled by piecemeal and putrid. It should be drunk when fresh drawn to the extent of two teacupsful in the evening and one early on the following morning, for several days. When the stomach is in such a state of irritability as to reject even every other medicine, it will retain this, which confers the additional benefit of improving the constitution. Occasionally it excites smart pains in the bowels, but these soon subside, and are followed by expulsion of the animals and sometimes a rapid recovery of health.—Let mothers whose circumstances afford them the opportunity, give this natural remedy only a fair trial and they will soon perceive the extent of its salutary influences, and the certainty as well as safety of its vermifuge powers.

Sea-water or a briny solution of sea-salt in spring-water has many times been employed against worms with decided advantage. When used freely and continuously, it irritates every kind of intestinal worms and renders

them very liable to be dislodged by an active aperient:—at the same time it stimulates the bowels and promotes digestion. Sulphur and sulphureous spring water may be used with a similar intention; but the former acts with greater certainty when stirred into a large hot poultice laid over the stomach and bowels, after the parts have been well washed with hot water and soap, and thinly besprinkled with mustard. In this way, the blood comes to be impregnated with sulphureous particles which have a tendency to affect the mucous secretion of the bowels, where the animals are prone to burrow, and thus ultimately to deprive them of life.

Tin-filings, crude quicksilver, the male-fern, worm-seed, tobacco, hellebore, and the bristly down of the pods of cowhage, with many other substances from the mineral and vegetable kingdoms, continue to be exhibited with like views, both internally and by lavement, as taste or judgment may direct. From its being often vitiated by the admixture of other inert substances the worm-seed is very generally followed by disappointment. Cowhage may be mixed with simple syrup or molasses into an electuary, whereof a teaspoonful is given to a child fasting, each morning for three successive days, after which a full dose of rhubarb must be subjoined. Madame Nouffler's celebrated specific for worms consisted chiefly of the male-fern in powder:—by this lady's rule, an adult patient, after being prepared at night by an emollient lavement and a supper of panada, requires to take three drachms of the fern for a dose early next morning and to repeat another instantly if the first should be rejected:—in two hours after this, an active purgative composed of calomel, gamboge and scammony, completes its operation.

Castor-oil and that of the olive are sometimes administered, but do not really seem to affect the tranquillity of worms by other than their aperient virtues. Essential oil of turpentine, however, is indubitably one of the surest, the safest, and most convenient of all the vermifuge drugs. On every occasion, after the full operation of an active evacuant of calomel and gamboge in arrow-root, and preferably in the evening, it may be exhibited under various forms,—as a draught, in a poultice, or by lavement. Should the first of these ways be deemed the most expedient, one or two teaspoonsful of this medicine, according to the child's age, may be mixed by smart agitation with four ounces of cold sweetened milk, or of such milk and mucilage of gum-arabic in equal proportions, or in a suitable quantity of the almond-emulsion. Draughts of this kind ought to be swallowed as rapidly as possible; and, during the act of drinking them, the nostrils may be moderately compressed:—diminishing the acuteness of smell, lessens the offensiveness of nauseating tastes. On rejection of the first, a second draught may be given as soon as the disturbance subsides; and, washing the mouth with cinnamon or rose-water holding a little alum in solution, or with ginger or common tea will, at all times, be found agreeable.

When applied over the stomach and belly, thick poultices, made with meal of peas or linseed and oil of turpentine, produce very surprising effects in disturbing and destroying worms. Their employment should be preceded and followed by such medicines, either by the mouth or lavement, as shall secure two or more free dejections:—their action is much promoted, by washing the parts with heated water and soap, before applying a common poultice, as hot as can be borne, and continued for

a few hours:—and, on this being removed, the surface must be well rubbed with a warm rough cloth, have a few grains of mustard sprinkled on it, and then be covered with the turpentine poultice. In twelve or fifteen hours, the medicine will have largely impregnated the blood, and may be withdrawn:—this singular result shall be attested by the odour of the child's urine, perspiration, and breath.

Preparatory and subsequent evacuations are equally requisite to the obtaining full advantage from turpentine, when exhibited in the form of lavement. One ounce of the medicine in two of milk, thin gruel, starch, arrow-root, or mucilage, intimately mixt by shaking them together, may be thus given to very young children, before putting them to sleep. If it remain in the bowels till the breath shall have become tainted, an aperient by the mouth, or a full tepid lavement should be administered for the purpose of perfecting its effects.—The operations of this remedy in eradicating intestinal worms are as certain and complete as those of ipecacuan in reverting the actions of the stomach:—it may be repeated several times as appearances shall require.

II. Numerous circumstances combine in disposing children to be frequently affected with various modifications of fever; but nearly all of these originate from disorder of digestion and its necessary tendency to derange the vital functions. Each of such febrile states has few *particular* distinctions, but is often accompanied by *general* symptoms denoting indigestion and weakness of the stomach or its excitement by crude substances, and irritation of the bowels by lodgements of impure matter unduly retained in them. On some occasions, there is sickness only; in others, vomiting supervenes; with head-ache,

thirst and foul tongue; inordinate slowness or activity of the intestinal actions; dryness and heat of the skin, with suppressed perspiration; restlessness and dislike of food, progressive decay of the strength, with concomitant emaciation; and nervous startings, or even convulsions the paroxysms of which occasionally become exquisite.

Immediately on the first manifestations of a tendency to feverishness becoming apparent, the young person should be well sponged with tepid water, have all the body's surfaces excited by rough dry frictions, receive a mild laxative, and then be made to remain in a cool bed for twenty-four or thirty-six hours, during the whole of which period, if the patient has already past through the infantine state, no food whatever ought to be taken and only a very little refrigerating drink. Simple as these means are, they often, without other aid, succeed in procuring the desired object. Should the fever, however, resist their efficacy as well as that of rest and abstinence, it will be requisite to administer an emetic and to promote its salutary influences by alvine evacuations, by frequent sponging the person with cold, tepid or warm water, and by the usual poultices on the head, chest and belly, at a low or higher temperature as experience shall approve.—Failure of these remedies, in all such cases, mark the boundary of popular interference.

III. Confinement of the bowels of infants or children always requires attention, from whatever source it may originate. Their having two natural dejections in each day is at all times desirable:—when one only is obtained, the movements of their digestive functions ought to be narrowly observed. When, therefore, sucking babes have gone into this state, they may derive advantage from their nurses taking daily one or more glasses of rhubarb-

wine, or from themselves receiving some whey of biesty milk, or having a teaspoonful of powdered jalap or rhubarb spread all over the stomach and bowels, and covered with a large hot poultice, before being placed to sleep:—this may be renewed for the sake of heat, and a minute addition of mustard will increase its efficacy.

Should these means, aided by frequent friction of the belly and spine with vinegar and spirits with nitre, fail of the indicated end, recourse must be had, in a few days, to a course of mild evacuating lavements. With every person, it ought to be a rule having an almost universal application,—never to introduce medicine of any kind into the stomachs of sucking or very young children:—its particular benefits are greatly overbalanced by its general disturbance of the system, which the sufferer cannot describe.—When, by careful observation, it shall be ascertained that sluggishness of the infant's bowels is caused or encouraged by the nurse's milk, this will require being changed:—such change however, especially if the mother be the suckler, ought not to be hastily consummated.

When older children are thus affected, the disorder may, in general, be removed by their taking large draughts of fresh whey or even cold water, for several mornings immediately on leaving bed;—or having an occasional warm bath, or fomentations, or hot exciting poultices over all the digestive organs at the time of going to sleep;—or substituting the phosphate of soda instead of common salt in their food.—Parents ought never to exhibit calomel as a laxative to the young:—the effects of its indiscriminate use in childhood are in the highest degree baneful to the constitution:—calomel indeed and Laudanum, thus given to growing persons, have ruined

more constitutions, than ever yet was done by the excesses of intemperance and debauchery by men of riper years.

IV. Excessive and unusually offensive discharges from the bowels of unweaned babes or young children proceed from many and very different causes; but they are all exceedingly important, and may lead to the most serious evils if exposed to mismanagement or neglect. These causes, among others, may be,—insalutary or unwholesome nourishment inducing relaxation of the system; difficult teething; substances lodging in the bowels and becoming irritative by reason of their chemical changes; constriction of the skin occasioned by exposure to cold; debility resulting from disease in one or more of the vital organs; or a bad quality of the fluids secreted for the purpose of completing the digestive functions.—Such, then, being some of the chief sources from which may originate an undue freedom of the bowels in infants, it is manifest that the furnishing instruction for more than a few simple applications might tend to misguide or embarrass inexperienced parents; and, by thus leading to error or delay, conduct to consequences having their final issue in disappointment and sorrow.

When, therefore, a sucking babe shall be found incurring danger from the effects of frequent and preternatural dejections, these, if not immoderate, may yield to careful frictions of the body and loins with the tinctures of rhubarb and kino in equal proportions, and either heated or cold as may be desired. At the same time and to the extent of an ounce daily, the nurse should take this medicine in cold water or other convenient vehicle. If, in the interval, the morbid symptoms shall maintain their course or become aggravated, it will be necessary to

spread a fine powder, formed by intimate mixture of rhubarb, mustard and opium in the several proportions of twenty, six, and two grains of each, over the abdominal regions, and to cover this with a large hot poultice made of bread, meal of peas or linseed and boiling milk, porter, or a strong infusion of hops:—this should be allowed to remain undisturbed so long as its temperature continues equal to that of animal heat. When such applications are removed, the parts should be well rubbed and dried, and protected from cold by a piece of soft flannel or chamois-leather; and, while the external remedies are producing their effects, the child may freely receive, at due intervals, isinglass dissolved in hot water and then mingled with an equal quantity of sweetened whey, or cow's milk, or preferably that of the nurse, unless the defective qualities of that be suspected of occasioning the disease. Several repetitions of this poultice may be deemed requisite; but, in many instances, it determines the best results when applied alternately on the bowels and the loins. Some infants recover by the use of an aromatic plaster covering all the length of the spine:—its virtues are remarkably increased by the addition of a few grains of opium sprinkled on its surface. Others derive particular benefit from the frequent application, to the belly, of vinegar and nitre, in folded cloths, carded cotton, or poultices, and either heated or cold, as experience of its influences shall guide:—and others, when there is reason to suspect the presence of worms, obtain full advantage from the employment of turpentine as formerly advised. Astringent and strengthening lavements may be continuously administered even to sucking infants:—after they are weaned, there may be propriety in giving these accompanied with internal medicine, as rhubarb,

kino, or catechu, and gum arabic, having for its object the inducing of a change of action in the bowels, dependant on a combination of the softening, astringent, and laxative qualities.—Guided by these suggestions, mothers may, on many occasions, succeed in eradicating the causes of inordinate freedom of the bowels in their young ones;—these causes, however, are too often not susceptible of popular control; and, as they shall be detected only by scientific discernment, will not be removable by other than the resources of scientific skill.

V. Whatever, by its quantity or qualities, offends the stomach of infants or children becomes a cause of sickness leading to repeated efforts of the system to accomplish its rejection. Attacks of this kind sometimes very suddenly supervene; but, when unconnected with disorder of the brain or other essential organ, are generally removed by vomiting and sleep:—these constitute the natural cure, which may be promoted by tossing the child in the arms, patting it smartly on the back, and rubbing the bowels, stomach and chest with the hand or a piece of heated flannel. When the stomach has unloaded itself, the babe must be put to bed, and should sleep before enjoying the breast:—hunger and repose conduce to the relief of many ailments, in every period of life.

If this kind of sickness frequently occurs, the state and nature of the nurse's milk should be examined, and alterations in her food adopted:—she will do well, also, to take the rhubarb-wine in suitable proportions. Children frequently seized with fits of squeamishness, may have their digestive organs strengthened by oily lotions or frictions with vinegar and nitre on the chest, belly, and spine. When older children are so affected, abstinence and sleep will, in many instances, remove the complaint:—if they

do not, an emetic should be exhibited; and, on its operation having ceased, the patient must go to bed, with a large poultice placed on the region of the stomach:—afterwards, one or more laxatives of rhubarb and ipecacuan, will rebalance all the functions of health.

Returns of vomiting also prove a source of great annoyance to some children:—this, however, is usually an aggravation only of the state of sickness, and will in general subside, on the offending matter being naturally or artificially expelled. If this consist of unripe fruits, or other indigestible substances, an emetic of white vitriol will procure their instant evacuation:—this remedy is quite safe and convenient, and may be administered to any young person more than two years of age.—While the stomach is experiencing such irritations, the use of a warm bath is improper:—it may determine very serious impressions on the liver or the brain.

VI. Gripings and colic pains, in children, are often quite transient:—in other instances, they have connexion with disease in some important organ. They may be constant or return at intervals; but, in either case, will be manifested by violent and unappeasable paroxysms of crying, forcible kicking with the feet, various writhings of the body, and occasionally by convulsive agitations requiring particular concern. Mental disturbance in the nurse, as was formerly stated, may give rise to alterations in her milk that shall be followed by such effects:—they may proceed also from inattention to the necessary changes of a young one's dress, occasioning its being injured by the influences of wetness and cold; from improper food causing flatulence and distention of the bowels, or their confinement or relaxation; and from an imprudent exhibition of purging medicine, especially calomel, inducing frequent

discharges of thin, ropy, and offensively foetid substances from the bowels, with all their train of exhausting and ruinous consequences.

When these symptoms are recent or moderate, their causes generally yield to the effects of a large warm poultice on the stomach and belly which, if desired, may be rubbed with spirits of hartshorn and have some opium and mustard sprinkled on the surface. Should the bowels have been slow, an opening lavement must be administered:—if they are too free, a lavement for the purpose of restraining their activity, as advised in another place, then becomes necessary. Mothers may solicit benefit for their infants from the narcotic medicines, as laudanum, or syrup of poppies, by external application or injection; but such means ought never to be exhibited by the mouth, except when specifically and regularly prescribed. In severe cases, where the dejections are tinged with blood, the belly distended and intolerant of even the slightest pressure, and where the child is flushed, feverish, and shows other marks of experiencing acute distress, the danger has become imminent and demands the promptest and best assistance that can be obtained.

VII. Many children suffer from disease of the liver. This generally commences with inflammation and, if not intercepted in its course, proceeds to suppuration, the consequences of which are always uncertain and dangerous. It arises from various causes, as unsuitable food or unguarded exposure to the atmospheric air, and most frequently begins with sickness, chilliness and pains in the bowels. While in this state, the symptoms may be treated as in the simple colic affections.

When, however, there are thirst, foulness of the tongue, heat and dryness of the skin, loss of appetite, frequent

dry cough with fits of difficult breathing, yellowness of the eye, high-coloured urine, and an intense fixed pain with an appearance of fulness and impatience of pressure in either side or near the stomach, this disease should be regarded as having already made advances. Grown persons, under such circumstances, usually experience a sense of uneasiness in the shoulder; but very young children cannot accurately describe such a feeling, and in many who are older, it does not exist. When a child undergoes a seizure so alarming, the duty of parents cannot be mistaken:—let them freely unload the bowels by means suitable to the sufferer's age and, after fomenting all the belly, place on it a large poultice containing much vinegar and nitre, cold or heated;—and, without waiting for the result, resign the case immediately to scientific treatment.

VIII. St. Vitus' dance affects both sexes indiscriminately:—generally, also, it occurs between the sixth year and the termination of childhood. Several instances, however, of its seizing children in their fourth year are known; and some females, in their twentieth, have suffered from its exhausting effects. Those who possess a weak constitution, or whose health and vital energies have been impaired by defective or insalutary food, or by neglect of the natural evacuations are most exposed to become its victims. Its approaches are slow and insidious. Previously to the more violent convulsions which ultimately attract the attention of parents, the growing disease is characterised by a progressive decline of the young one's strength and sprightliness; variable, often an insatiable appetite; constipation of the bowels, becoming more obstinate as the disease advances; swelling and hardness of the belly below the navel; and slight, irregu-

lar, involuntary motions of different muscles, especially those of the face.—This is the primary stage; and it is now, if ever, that popular management can be expected to avail the sufferer.

Subsequently, in different instances and at different times, the muscles of the extremities with those that move the lower jaw, the head and the trunk, become affected:—many patients now cannot walk with steadiness; their gait indeed resembles a jumping or starting:—others lose altogether the locomotive powers, and seem palsied:—neither can the implicated arms execute the most common or necessary motions. Such convulsive agitations acquire more or less intensity:—except during sleep, they are almost incessant; then, however, they generally subside, but re-appear when the young one awakens. Although various muscles, in some cases, experience convulsive motions, yet in general those primarily disordered do not regain their natural state, so long as the disease maintains its ascendancy. Speech, by and by, comes to be impeded:—not seldom, it is completely suspended:—and, occasionally, the act of swallowing cannot be performed without difficulty. Ultimately, the eye loses its lustre, and beams no longer with vivacity and intelligence; the countenance grows pale and vacant, and expressive of the deepest languor; and when the disease is permitted to proceed undisturbed through its course, fatuity to a certain extent interrupts the exercise of the mental faculties.

Like most of the juvenile diseases, this is seated in the stomach and digestive organs:—its occasional causes are, bad nursing, unsalutary diet, accumulations of matter, worms, or other sources of irritation in the bowels, inducing local as well as general debility, and an excitement of

the nervous system. Sometimes, also, it originates from an imperfect development of those changes which the constitutional health requires being perfected at the period when childhood terminates.

Prudent mothers, by these representations, must be led to admit the propriety of limiting their interferences for the cure of this affection, to its earliest stage. By redoubled attention to the kind and quantity and effects of the patient's food, and by a judicious employment of exercise, as walking, dancing, riding on horseback, their exertions will, on some occasions, be unexpectedly promoted. Additionally to these important auxiliaries, a course of laxative treatment ought, above all things, to be instituted and perseveringly continued till some alteration of circumstances shall supervene. With this end in view, castor-oil, rhubarb, phosphate of soda, or other *mild un-irritating* aperients may be administered, according to the young person's age and strength, on alternate days, with lavements calculated to determine similar results. Frequent and vigorous friction also of all the spine and abdominal regions with strong whisky or spirits of harts-horn, or poultices placed on the same parts and containing stimulative and invigorating properties, cold or heated as observation shall suggest, may be freely practised in aid of the internal remedies. Persons so affected bear large alvine evacuations and often prosper under their use:—let parents, therefore, be encouraged to persevere; and, in so doing, they may best expect success as the reward of their fortitude.

IX. Strumous decline seldom attacks children during the first, or after their fourteenth year:—it depends *immediately* on debility of the system, and *remotely* on the causes from which this debility itself originates. Among

these the chief are, an impure, cold, or humid atmosphere; not easily digestible, or improper food; worms and the excitements of difficult teething, occasioning feverishness and indigestion; disorder of the vascular functions through which the nutrient chyle is transmitted into the blood; protracted and exhausting illness of whatever kind; and the defects of health resulting from the scrofulous predisposition.

Infants going into this disease become fretful and impatient; they get a dry cough and have occasional vomiting; their little shoulders and chest heave in respiration; their dejections cease to be natural in their appearances, consistence and returns; in some children they are defective, in others too frequent; in many they contain particles of unassimilated food; in all they are offensively foetid; the urine acquires a milky whiteness and its flow is accompanied with feelings of distress; in the end, the belly swells, has intermissive gripings, or remains in a state of permanent distension and the seat of very acute pain; and, the strength fails, aversion from food increases, and the emaciation, in not a few instances, is extreme.—When this disease attacks older children, its primary symptoms exhibit a kindred character, but are usually more insidious;—and, in being longer protracted, its ravages on the system progressively come to be more obvious, more extensive, and more profound. An array of these, however, would be most unsuitable to this place where it is only necessary to remark, that the resources of popular knowledge can never be applicable to other circumstances of this affection than those of its earliest stage.

Atrophy of this kind may yield, at its commencement, to the virtues of such means as conduce most to the re-

moval of whatever obstructions may exist in one or more of the abdominal organs,—to equalise the distribution of blood and chyle where this may have been deranged,—to promote the first processes of digestion,—and to restore or enliven the functions of the skin. These ends, in infants and younger children, may be solicited and, if the means be used early and steadily, will be obtained by altering or correcting the diet, by application of relaxing and at the same time stimulating substances in fomentations, frictions, and poultices over the principal as well as subsidiary organs of digestion, and all the extent of the spine. Lavements, also, will prove convenient vehicles of such medicines; and the greatest advantage results from charging these and the poultices with sulphur and turpentine:—the virtues of them all, moreover, will be much supported by due exercise, and the immediately putting the patient in a flannel under-dress. Rhubarb, colomba, ipecacuan, and canella alba in powdered composition, or the same medicines in a fluid mixture may be given internally, when such a mode is proper:—they should be exhibited in free doses and on alternate evenings, the lavements being substituted on the intermediate.—Calomel and blistering, in this disease, produce the very worst effects when injudiciously administered:—parents, therefore, and the unskilful cannot be entrusted with the exhibition of such energetic remedies. The former has a certain tendency to induce defective or irregular digestion, and to deteriorate the vital qualities of the blood which, in animals, is the prime fountain of their living and material natures; and the latter, from the powers of life being oppressed in the central and consequently enfeebled in the superficial organs, is apt to be followed by feverishness, inappetency, and irritable sores.

Besides the strumous now described, there are several other varieties of atrophy or general emaciation proceeding in a chief degree from an interior visceral disease, as that of the kidneys, spleen or liver, and even of the lungs, which last forms true consumption and does really occur in infants, though less frequently than in grown persons. By far the greater part of these juvenile wastings, however, has connexion with one modification or other of the scrofulous taint. With reference to such circumstances, then, let it be a general rule, that in almost all the illnesses of children, whatever be their immediate source, it is the duty of parents to direct an observant eye to the state of the bowels and stomach, whose derangements generally constitute the first symptoms, and to endeavour by the promptest means to correct their disorder, or the first and slightest sign of such disorder, so soon as it shall appear.

X. Scrofula may be noticed in this section, from its intimate dependence on the circumstances of digestion.—Many characteristic indications go to establish a distinction between the scrofulous state itself and the morbid disposition from which it originates:—this disposition really exists in nature, and is at all times accessible to observation. Whatever be the form it assumes, this malady is as insidious in its approach as it is gradual in its development. Various constitutions and very dissimilar textures are susceptible of the diseased actions on which it depends; and these constitutional as well as textural circumstances, in a particular manner, determine its characteristic manifestations.

Children and the young suffer oftener from the scrofulous affection than those of riper years. From its influence, however, no period of life or condition of sex is ex-

empted. Age, indeed, alters the predisposition to it, in different structures:—in childhood and adolescence, the upper lip, the eyes, and the glandular system are prone to become the site of scrofulous lesions; the lungs, the visceral tissues, and spongy part of the bones, acquire an increased degree of liability to sustain their ravages in after-life.

Systematic writers regard the scrofulous habit as being characterised by a great assemblage of distinctive symptoms:—many of these, however, occur in other diseases. Persons in whom this habit obtains are distinguished by a particular delicacy and langour of countenance; their cheeks are soft, smooth, and flaccid; the lips have a mellow redness, while the parts around the mouth are of a dull pallid hue; there is an indescribable appearance about the eyes; the pupil is generally dilated; from its vessels being impermeable by the red globules of blood, it exhibits a pearly whiteness; and the upper eye-lid is unusually depressed. Universal experience will confirm the remark, that there are no legitimate grounds for regarding the white and rosy cheek, the flaxen hair and azure eye, as signs indicative of a predisposition to scrofulous diseases. Whoever has extensively and philosophically investigated this interesting subject must be convinced, that persons having every variety of complexion, from the finest European tints to the darkest Ethiopian hues, are alike exposed to it; and, that it is only necessary to place them in circumstances favourable to its development, to have it fully established.

The scrofulous state is, *in some degree* determined by the simple or combined operation of such causes as the following;—cold and variable temperature; excessive humidity and impureness of the atmosphere; mental disquiet-

tude; inactive, luxurious, intemperate life; indigestible, defective, or insalubrious nourishment; precarious health induced by inflammatory, febrile and nervous diseases; debility resulting from the action of mercury; contagions of various kinds; hereditary or congenital peculiarity of the person's organization; and, *in a chief degree*, by all those agents whose influences derange the vital, particularly the digestive functions; and, by altering the natural actions of a part, give rise to that change of structure which is termed a scrofulous disease. It has been observed to occur in children who, instead of being suckled at the mother's breast, are fed with the spoon; in others who, though suckled at the breast, have had only a scanty allowance of old and vitiated milk; and also very frequently in those who, while young, could obtain only a watery vegetable aliment.

Scrofula, in frequent instances, really is a hereditary disease:—every person of experience must be possessed of evidence sufficient to confirm this proposition.—A woman died of consumption in the last month of her pregnancy; and, on her body being examined after death, the lungs were found full of tubercles, some of which had suppurated and destroyed much of the substance of the lung:—in other respects, the body was in a healthy state. The child's lungs were in precisely the same condition as the mother's, being studded with scrofulous tubercles some of which also had suppurated:—its body was otherwise free from disease.

Particular attention in the attempts at preventing or curing scrofula, ought to be directed to the digestive organs:—in the prevention, by avoiding all those causes which tend to disturb their functions; and, in the cure, by tranquilizing irritation, and restoring their healthy ac-

tions. For the attainment of these general objects, an appropriate management of clothing, diet, and medicinal agents ought to be instituted.

Frequent vicissitudes of climate have ever been injurious to health; and, in this country, are deemed necessary to the prevalence of scrofulous affections. Their effects on the animal economy will be best counteracted by employing means adapted to preserve the body's temperature as equable as possible. For this purpose, parents should take the greatest care that the natural functions of the body, especially of the skin in children, be performed in a regular and healthy manner, and that they be not subjected to confinement for hours in close warm apartments, and then sent into the open air, where the temperature may be twenty or thirty degrees lower, without any additional clothing, except a covering for the head. When, therefore, any young one exhibits personal or functional signs of being liable to suffer from the scrofulous affection, there will be much propriety in securing for its use the advantages to be obtained by the use of woollen or chamois-leather clothing:—whenever indications for its employment appear, it must be forthwith adopted; and, so soon as the call has ceased, this dress may be discontinued.—Stimulating food and drinks, of every kind are to be carefully withheld from scrofulous children. They ought to eat no more at one time than can be easily digested; and their meals, consisting solely of good and nourishing fare, should be taken at regular intervals. Nothing can be more injurious than living irregularly; perhaps fasting for the greater part of a day, and then eating an immense meal, as the natural consequence of it, must be to excite the whole system, to a state of fever, besides the immediate bad effects it has on

the stomach and bowels; and, as hunger and thirst are incompatible sensations, eating and drinking should not be indulged in at the same time; in both an equal degree of regularity is necessary. Let it be recollected, however, that these observations apply only to the simple state of a scrofulous constitution, which is not suffering from local disease. In complicated cases wherein such local disease is extensive and producing irritation, pain, disturbance of the natural functions, and hectic fever, experience has shewn that generous diet and stimulating drinks are not only admissible but useful.

Consistently with these general views of the disease's nature, the keeping the bowels regular and the secretion of bile natural, constitute the most important points in its management. But it will be in vain to attempt improving the health, or regulating the actions of the bowels by medicine, if a strict attention to diet, exercise and clothing be not at the same time uniformly maintained:—for, if the stomach be overloaded with food, no salutary digestion can take place; and, if the food be improper in quality or quantity, no medicine whatever can act beneficially on the bowels. As, however, the constitution as well as age of children, who may become affected with this disease, are necessarily very different, it is impossible to decide at first what medicine shall be applicable to each particular case:—medicines, indeed, act very differently on children of even the same age; and, that what purges one violently, will have no effect on another. Above all things it is necessary to guard against giving violent purges, and it is particularly necessary to avoid large purgative doses of calomel, which always excite more general irritation than the evacuation from the bowels is able to relieve; and they often so much weaken the

stomach that a very long time elapses before it is able to recover its natural powers. The chief object, therefore, in prescribing medicines should be to procure a proper emptying of the bowels daily, and a healthy condition of the secretions. Any of the mild purgatives by the mouth, or of those advised so often already in external application, may be employed for this purpose, and if one does not appear to have the desired effect, it is right to desist from its use and substitute another. The very great influence which evacuations from the bowels produce on all the rest of the body must be perceptible to any impartial observer:—it is, therefore, certain that, by increasing or diminishing them, a decided impression on the whole or on one particular part of the body may be determined. Thus, if there be much *general* irritation, or *local* irritation and inflammation, by augmenting the intestinal discharges, taking care however not to exasperate the bowels, we shall greatly relieve both the one and the other of these states.

Solutions of isinglass in warm milk, animal jelly, and the nutritive farinaceous foods, frequently prove advantageous in the management of a scrofulous constitution. When there is an excess of acidity in the stomach, soda or prepared chalk will tend to correct this cause of distress:—tonic medicines seldom have the effect of strengthening the system, and they possess no specific power whatever over the disease. When there is only a predisposition to it, and before the supervention of any active local affection, sea-bathing may under certain circumstances be made beneficial by rendering the body less susceptible of cold, and consequently less likely to be influenced by the vicissitudes of climate. Nevertheless this is altogether incapable of promoting the discussion of scro-

fulous tumours or healing the ulcers which proceed from them; and, it is injurious in all cases where there is reason to suspect even a disposition to tubercles of the lungs. Observation and reflection lead to the conclusion that persons threatened with becoming scrofulous should, on no account whatever, remain longer than four months in the year at the sea-side; and there will be advantage in dividing even this period by a temporary change of residence. Warm bathing is unsuitable to such complaints:—it hurries respiration, quickens the pulse, and injures the general health:—good air and exercise, however, are conducive to their cure, in having a tendency to promote the regular performance of the vital functions.—Scrofula, in fine, is hereditary, but the tendency to it may exist without being called into action:—a disposition to it may be acquired, where there is no hereditary tendency:—whatever necessarily contributes to derange the natural actions of the body is capable of inducing it; and, hence, it is always a constitutional disease:—it may very often be prevented by avoiding all those causes that have a direct influence in disturbing the general health:—and, it can only be cured by protecting the system from every source of irritation, and by restoring the natural and vigorous functions of the digestive organs.

When the scrofulous constitution becomes established, there is no structure nor organ of the body which may not be attacked by the consecutive disease; and, it is quite consistent with observation, that some parts are more obnoxious than others to be so influenced. Local scrofula, therefore, occurs in the glandular system, as the female breast and glands of the neck; in the bones and spine; in the ancle, knee, hip, wrist, elbow, and other joints; in the lungs, heart, liver, pancreas and spleen;

the kidneys and intestines; and in the eyes and the brain.—Such, then, being the vital organs which appear, as it were by selection, to be most exposed to undergo the ravages of this ungenerous malady, greater service shall be done to parents by dissuading them from all unskilful interference with topical swellings, inflammations and sores having their primary source in the scrofulous constitution, than by confusing them with distinctive rules for the management of morbid affections which too often, even in the hands of wisdom and experience, prove most unmanageable. When, therefore, a tumour of this kind has arisen, for instance, under the jaw, it is quite sufficient, *so long as the part remains free of heat, pain and redness*, to secure it from the impressions of cold or extraneous irritation by covering it with fine carded cotton, chamois-leather almost daily renewed, with fur, or with flannel:—when, on the other hand, *it grows painful, hot or inflamed*, lotions or fomentations without friction, or poultices containing water and salt, vinegar with nitre, spirits, vinegar and the ammoniated muriate, or similar liquid compositions, either cold or heated, are adapted to check the enlargement of such tumours and sometimes to procure their resolution. Incipient swellings of the joints require the same applications;—but, let it never be forgotten that the constitutional treatment is by far the most important; and that, when the local disease does evidently make advances, there is the truest benevolence in implicitly resigning its care to the legitimate resources of art.

THORACIC DISEASES.

FEW of the diseases, having their chief seat in the neck and chest, are peculiar to childhood. Among these, may

be first described, imperfect formation of the heart, and dropsy of its capsule.

I. Both these states, then, take their commencement during the foetal period of existence; but their effects on the system do not, of course, become apparent till the vital operations require being perfectly established. Their general symptoms are so much alike, that the eye of experience alone can distinguish between them:—in such cases, there is difficulty of sucking, and of breathing which occasionally has intense accessions threatening suffocation; the pulse is very weak and often intermits; all the person has a clammy coldness especially in the extremities; the lips are purple or livid; the cheeks seem bloodless; the eye heavy and agitated, and the whole surface has a dull bluish or leaden colour.—When such appearances prevail, the duty of parents is merely to attempt, with the simplest means, the maintaining freedom of the bowels and correcting what acidity interrupts the digestion of nourishment and disturbs the circulation:—more, even the most skilful assistant might not be able to accomplish, and error may hasten or aggravate the course whereby the young one shall escape from sufferings which are not easily alleviated and whose causes can seldom be removed.

II. Croup assumes two distinct forms, each of which is modified by personal circumstances and the morbid causes wherein the disease originates. When *acute*, its course terminates, in a few days, either in health or dissolution:—when *chronic*, it extends occasionally to several weeks or even months. Under both these varieties, it begins with the symptoms of an ordinary cold; but it essentially consists in a peculiar inflammation that, if unobstructed, may implicate the whole range of the wind-pipe to its minutest ramifications in the lungs.

Acute croup commences with a slight cough, sneezing and hoarseness which, in a day or two, are succeeded by a particular shrillness and singing of the voice. These are its more prominent symptoms,—pain about the upper end of the wind-pipe, with increasing difficulty of breathing and a whizzing sound in performing the act of inspiration, as if the air-passages were straitened;—often, the cough is dry; but, if any thing be expectorated, this in some instances has a purulent appearance, in others consists of fibres resembling portions of a membrane;—an uneasy feeling of heat, frequency and hardness of the pulse, restlessness and the usual manifestations of the feverish state;—redness and swelling, in many cases, on the back parts of the mouth which occasionally also have an appearance of being smeared with matter similar to that rejected by coughing;—the lips and cheeks are alternately pale and livid;—from the violence of the strugglings, the head and face remain constantly bedewed with perspiration;—the embarrassment of breathing augments;—the countenance exhibits great distress;—and the sense of strangling acquires deeper intensity, and more frequently returns.—Medical history has not yet recorded any evidence of this disease having a contagious nature.

Croup, then, is the result of true inflammation, accompanied by considerable spasmodic action and fever:—its essence consists in the secretion of a viscid and concrete membrane which lines the wind-pipe and is perpetually endangering suffocation:—and it proceeds from whatever causes tend to weaken the lungs, or excite any degree of irritation so as to favour the establishment of a preternatural secretion into the tubes or air-cells of that organ. Such being the nature of this formidable disease, its cure demands a prompt and active attention, and should be

directed chiefly to the object of counteracting and removing the membranous deposition which is every moment in danger of producing suffocation, especially in very young children in whom the natural aperture of the wind-pipe is often not more than a line and a half in breadth. Error here or neglect on the part of parents may, therefore, lead to a train of very distressing circumstances.

While the symptoms are merely those of an ordinary cold, they may be treated with frictions of the spine, frequent sponging of the body and extremities with stimulating fluids, either cold or hot, or with fomentations of the belly, trunk and neck, or poultices, and with mild aperients as shall be preferred. On the very first appearance, however, of the croupy cough and breathing being perceived, the most energetic remedies become indispensable. These may be administered in the following order,—leeches on the throat close under the chin, to the number of three for each of the first four years of a child's age, and two for every year of one who is older:—immediately on the animals ceasing to suck, their bites should be stopped from bleeding by the means described in a former section, and the whole anterior portion of the neck, the chest and the belly covered with sulphureous poultices or preferably with such as contain much turpentine:—next, a smart laxative must be exhibited and at the end of two or three hours, brought away by a large opening lavement, if it was taken by the mouth:—and, on this having operated, another charged with turpentine and destined to remain for some time in the bowels, ought to be injected.

Such applications directly oppose inflammation and, in this disease, its peculiar results:—they may be continued or repeated as necessary; and, in many instances, they will subdue an attack of croup at its very outset. The

turpentine, in particular, augments in a remarkable manner the natural secretions of the bowels; and, in this way, by withdrawing secretable particles from the blood, acts as an obstacle to the formation of that morbid deposition in the wind-pipe, on which the essence as well as danger of this malady depends. Calomel, in free and repeated doses, has been valued as one of the surest means of saving a young one afflicted with croup:—there is much mistake, however, in this practice, and many sad failures have been the result. The green dejections described as the test of its having taken good effect, are really nothing more than the mere effects of its tendency to augment the secretion of bile. By this quality, the medicine may *assist* in intercepting the disease's progress; but the chief advantages derivable from its use, are those afforded by its purgative virtues. For such reasons, it ought not to be exhibited here but as a purgative, and should be followed in a very few hours by an opening lavement, with the view of preventing its injurious effects of impoverishing the blood. Whatever has the power of restoring or increasing their activity in the secreting vessels of the digestive organs and the skin, without impairing the sufferer's strength, shall be the best for counteracting this malady's very dangerous course:—and, experience itself will demonstrate that turpentine with the aid of superficial excitement and moderate evacuation should be preferred.

Chronic croup begins with the child being affected in a manner little dissimilar from that which characterises the former kind; but, as the course of this is more protracted, the symptoms accompanying it are proportionately less violent. While, therefore, the disease exhibits its primary manifestations only, and so long as its advances are moderate, such remedies as are calculated suc-

cessfully to oppose its first progress in the acute form will be quite suitable to the management of those peculiarities whereby the chronic is distinguished. Under each of its modifications, however, it remains but for a brief period susceptible of impression by popular instrumentality:—for this important reason, it always requires the best treatment:—where, as in croup, the morbid actions are rapid and violent, delay becomes particularly dangerous.

III. Chincough originates from sources which generally elude the most inquisitive research:—on this account, it has been regarded as proceeding from a miasm having a specific nature and peculiar quality which, without being essentially linked with fever, exercises a direct determination to the lungs. It is an infantile disease; but sometimes occurs in adults:—it rarely attacks a person more than once during life; and lasts irregularly from three or four weeks, to as many months. Moistness of the skin, warm extremities, open bowels, plentiful expectoration, and free vomiting, are its favourable symptoms.

At first, the expectoration is small in quantity, but afterwards becomes more abundant:—it is always viscid. During the paroxysms of coughing, the whole system sustains great and violent agitation, and the hoop is often accompanied with rejection of the contents of the stomach. While the fit lasts, the face is turgid and purple from suffusion; the eye-balls swollen and prominent; and the patient, as if with an instinctive forewarning of the attack, falls on his knees or clings to the nearest support. Instantly, however, the violence is forgotten; and, after deeply panting for breath, he returns with eagerness to the interrupted play or other pursuit, and the vomiting is succeeded by a craving for a new supply of food.

In this disease, a morbid irritability of the mucous

glands of the wind-pipe is the primary affection, to which the gaspings and spasms are only secondary:—hence, when in the height of its course, it is usually accompanied with a very copious secretion of the mucous fluid, a free discharge of which mitigates the general symptoms.

Attention should be directed, in treating chincough, to whatever will moderate the influences of its essential nature, protract the return of the convulsive paroxysms, and mitigate their violence. For this purpose, bleeding is sometimes found necessary in severe cases; but, except in such cases, it ought always to be avoided, because spasmodic affections are often rather increased than diminished by abstractions of blood. Light, nutritive food is beneficial;—confinement of the bowels should be carefully prevented;—no benefit will be derived from strong purging. Emetics prove the most effectual remedy, and such as act without harshness may be freely administered:—their action tends equally to interrupt and moderate the paroxysms and to keep the lungs unloaded, by producing a determination to the surface. When the disease is protracted, the irritative power on which it depends generally consists in habit alone:—it then becomes requisite to oppose this habit, which is spasmodic, by an appropriate employment of antispasmodic means. These may be sedatives, which remove their morbid irritability from the affected muscles;—and stimulants, for the purpose of inducing a local and general revulsion;—and tonics, with a view to invigorate the system and particularly the weakened textures of the wind-pipe and other implicated parts:—parents, however, should not venture far in this part of the treatment. They may use opium and hemlock; but such medicines must always by them be externally applied. After reddening the surface by fo-

mentations of hot water or frictions of artificial musk, either of these drugs in a powder formed of itself and mustard in equal proportions, may be sprinkled on the neck, breast, or spine between the shoulders, and then covered with a warm poultice:—this and the powder may be repeated as often as circumstances shall indicate.

When stimulating remedies are deemed requisite for taking off the propensity to spasmodic movement in the wind-pipe, these also ought never to be exhibited through the mouth, except by the best discriminating prescription. Simple poultices, hot and containing a little garlic or mustard or even the blistering fly, form very convenient applications of this kind:—such, likewise, are embrocations containing spirits of hartshorn with camphor and that of the olive or any other of the more penetrating essential oils:—but the best and surest of all such means are rubbings with artificial musk, or poultices of turpentine having their surface slightly smeared with a few drops of the croton-oil:—either of these will prove beneficial by its action on a multitude of nerves having immediate communication with the muscles of the chest, with the diaphragm, the lungs and the heart.

Chincough, however, can be managed in all ordinary circumstances by the use of mild aperients, occasional emetics, with tonic medicines supported by light nourishment containing in it solutions of isinglass or mucilage of iceland-moss. Frictions of the spine and chest with spirits, vinegar and nitre, or similar lotions, by bracing the system, will conduce to the same end; and, if there is no fever, a child of three or more years may have full doses of the compound tincture of bark, on going to bed. But the most important part of the tonic plan of treating this disease consists in a change of air, especially where

the difference of temperature can be rendered considerable, as from a low to a high atmosphere, or from an inland residence to the sea-coast:—at the same time, cold-bathing, will be more advantageous than any prescription whatever, by introducing a new action into the system.

CEPHALIC DISEASES.

CHILDREN are liable to several affections having their chief seat in the mouth, face and head:—of these, the common Cold is not the least frequent.

I. Exposure to the external air inducing a suppression of perspiration is usually accounted the origin of this disease. Something, however, must depend on the actual state of the constitution at the moment of seizure; and something also upon the variable quality of the atmosphere; and, a change in both generally concurs in forming its determinative cause. Its more ordinary manifestations are,—a sense of fulness in the head and of weight over the eyes, which are inflamed and float in tears; the nostrils first become obstructed and subsequently pour forth a thick acrimonious fluid that excoriates the skin as it descends and is accompanied with frequent sneezing; the voice grows hoarse, the back parts of the mouth sore, and the lungs loaded with excess of the mucous discharge which occasions a troublesome cough; and, in many persons, some degree of feverishness supervenes.

Mild cases of cold require only a few days of confinement in a room having a warm but not close atmosphere, aided by abstinence from all heavy and exciting foods and drinks. At the same time, the body and extremities may be freely sponged with heated water or immersed in a bath, for the purpose of encouraging perspir-

ation;—and the digestive organs must be carefully regulated, in infants, by means of gentle lavements and in older children by opening medicines, as rhubarb or castor-oil internally exhibited. When oppression arises in the chest or head, with considerable fever, there will be advantage in placing leeches on the temples, in giving a smart evacuant, in covering the chest with large warm poultices, in using a foot-bath, and in some instances, exhibiting an emetic.—If such remedies shall not be able to subdue the cold, it must be held as depending on a cause which the uninitiated eye cannot penetrate.

: II. Inflammation of a particular kind affects the glands under the ear:—it is attended with local swelling; and, in some young persons, extends widely and occasions much pain, but rarely tends to suppuration. It is called *mumps* in the English, and *branks* in the Scottish vernacular language. Though occasionally confined to one side of the neck, a tumour generally occurs in both, but soon becomes diffused to a considerable extent so as to involve the glands under the chin:—it is seldom accompanied with much fever, and usually increases till the fourth day, after which it gradually declines.—Many writers have implicitly adopted, from their predecessors, the saying that this disease is contagious; but there exists an extreme difficulty in the way of discovering the kind of evidence from which the doctrine has been deduced.

Covering all the neck and side of the head thickly with carded cotton, or chamois-leather, or a smooth poultice whose temperature is regularly maintained at that of animal heat; frequent sponging the person with heated vinegar and nitre, aperient and internally refrigerant medicine with sometimes a mild emetic, and security from the vicissi-

tudes of atmospheric influence, will in many cases conduct this affection to a favourable termination.

III. Thrush attacks infants soon after their birth, and consists in an eruption of minute vesicles which, when mature, are filled with a white milky fluid. These usually appear first on the angles of the lips, whence they spread over the tongue and cheeks, till at length many of the pimples coalesce and form patches. Next, they beset the back parts of the mouth, descend through the gullet into the stomach, and proceed over the entire course of the bowels, inducing dejections loaded with filmy sloughs. When the disease is very mild or restrained by right management, it does not extend beyond the mouth, and terminates with a single separation of the curd-like crusts. Usually, however, it makes greater advances, and a second, or even a third crop of pimples succeeds that which disappears. In the mean time, the digestive organs exhibit signs of being disordered by the presence of acrimonious fluids, the pulse is quickened, and the babe becomes restless and impatient; nevertheless the general health seems little disturbed. In those of a sickly habit, however, when the food is insalutary and the frame weak and emaciated, the vesicles ulcerate, the sores spread wider and deeper, low fever ensues, and the young one sinks underneath its malignity.

Even in its mildest form, this eruption appears to be intensely acrid and erosive; for the nurse's nipple is sure of being affected:—its nature also is specific and contagious. In order, however, to multiply itself and preserve its peculiar powers, it is necessary that it should come into close union with a membrane of the same structure as that in which it originates:—hence, the nipple though eroded by the humour never produces thrushy pimples,

nor does the sore on it spread beyond the range of the acrid discharge; but the disease has been received by kissing the infected lips of an infant, and in this manner propagated itself to grown persons.

On first observing this eruption, if her infant be at the breast, every mother ought carefully to examine, and when necessary endeavour to repair her own or the nurse's health:—she should also ascertain the nature of the milk and whether the nipple itself be free of all primary disease:—and, if the child be weaned, her particular attention to the quality of its food will be requisite, as well as to its preparation, concerning which the attendants, when left to themselves, are often too careless. With these things in view, a mild laxative or emetic may be given, for the purpose of removing all offensive substances from the stomach and bowels, and thus rooting out the original source of disease. In mere babes, an opening lavement containing a little turpentine or rhubarb sprinkled on the stomach and covered with a warm poultice, assisted by heating frictions over the spine, will be sufficient. At the same time, the pimples and sores, should be frequently and diligently cleansed with suitable lotions applied, in the young, by a soft flat hair-pencil, and in older children, by the free use of gargles:—the simple syrup, or that of roses, or mucilage of gum arabic, or honey, holding a moderate proportion of kino in solution, will be found very beneficial both to the child's mouth and the mother's nipple. Such applications, however, ought not to be very powerfully astringent, lest they hurry off the white specks too rapidly, irritate the tender surface of the new skin, and give rise to a fresh eruption:—this is excited more frequently by a too busy and precipitate interference, than by any other cause. When the

digestive organs are perceived to be affected, their improvement may be solicited by exhibiting powders of rhubarb, magnesia and kino in equal parts, or by lavements of arrow-root, holding kino and turpentine, aided by similar remedies placed on the surface, by cool or heated frictions, fresh air, due exercise, and an appropriate diet having a proportion of the isinglass or animal jelly.—Whenever such pimples pass into ulcers on any part of the mouth, and become dark or fœtid or gangrenous, and when the palate, tongue, jaws or cheeks suffer extensive erosions, their treatment must be scientific.

IV. Teething, when difficult, is apt to induce derangement of the vital functions, especially those of the alimentary and nervous systems. Acidity of the stomach with occasional vomiting; quick pulses, hot dry skin, and unnatural dejections, with swelling of the belly and emaciation, require being corrected by the remedies advised for moderating or removing the fevers of infants. On this being discovered to be the cause of convulsive agitations, these must be met by such means as were recommended in the section where management of such affections was considered. Little reason is afforded by experience, for regarding local applications to the gums as having ever contributed to the relief of painful dentition:—pure air, frequent change of dress, tepid or cool sponging of the body and spine, with regularity of the bowels and salutary nourishment prove far surer instruments of obtaining a favourable result. Dexterity of the nurse, however, may enable her to rub the surface of the gum over the advancing tooth with the sharp edge of her nail, so as to promote its final development. In doing this, the motions should be rapid; and what force can be endured, without occasioning pain, ought to be employed.—Scari-

fication of the gum, as well as the management of bad teeth, will be advised and executed by the surgeon.

V. Spasmodic startings, the inward fits of children, and all their convulsive motions, proceed from the excitements of difficult teething, from worms and whatever irritates the bowels or the nervous system and brain. Such affections originating from painful dentition, may be moderated by keeping digestion and the perspiration free, and by supporting the strength with food and exercise, friction of the spine, and sponging the body with bracing fluids or medicated lotions:—by thus invigorating the whole system, the progress of dentition will be facilitated. When it is requisite, the gum may be scarified; but mothers cannot discriminate this necessity, nor execute the operation when indicated.

When worms form the source of nervous disturbance, the remedies for expelling them should be administered:—other substances offending the bowels may be removed by opening medicine. Where acid in the stomach or flatulency is its cause, some carminative, as peppermint or anise-seed, with magnesia and rhubarb, may be given at least to weaned children; but, before using the former, the bowels must be freely relieved by lavements.

Cold or heat applied to the surface by fomentations, poultices, sponging, and bathing, is useful in these cases. Sudden application of cold, by a blast of air or affusion of water, induces an universal shuddering and a contraction of the skin; and, hence, transfers the spasmodic action from a particular organ or set of organs to the superficial textures of the body. If the cold, in this way, excite a general re-action and the shuddering be followed by a feeling of warmth, it becomes a direct tonic:—it may therefore, be employed with perfect safety, and

will prove more beneficial in a close nursery, than the more popular prescription of a warm bath. Advantage, indeed, has been obtained, in many instances, after failure of this last remedy, from taking an infant and exposing his body naked, for a few moments to the air of a window thrown open to allow it to blow upon him. The great diminution of sensibility which prevails at such a time, prevents all danger of being affected by the cold; and the patient is usually revived by the rush of air, and his fit almost instantly subsides.

Heat, when combined with moisture, acts in such disorders by a double power:—it relaxes and stimulates, and thus tends to balance the opposing states of morbid rigidity and morbid mobility, on which the convulsive diseases depend. Warm bathing, in this way, produces desirable results in the convulsions of infants:—but, the fact ought never to be forgotten, that both its effects, as well the stimulating as the relaxing, have a great tendency to weaken the system; and, for this reason, the warm bath must be given with caution to the young, and not too frequently repeated.

VI. Water in the head is almost peculiar to infancy:—it occurs oftenest in delicate children and those possessing the scrofulous predisposition:—such as have attained their fourteenth year are less exposed to its attacks. Next to the common appearances of indisposition, an affecting expression of uneasiness manifested by the child on raising its head from the pillow, and an instinctive anxiety for the relief afforded by having it immediately replaced, usually form the earliest indications of this disease. Among its general symptoms may be ranged,—intense and unremitting pain in the head, especially across the brow; great diminution of sensibility; suffused

redness of the eyes and aversion from light ; sudden interruptions of sleep ; sickness at stomach, loathing of food, and occasional vomiting ; obstinacy of the bowels, with glossy dejections which, when urged by medicine, have a dark-green tinge and an offensive odour ; at first, the pulses throb with preternatural rapidity, but afterwards become inordinately slow ; and the skin is dry and parched with a feverish heat. Although some obscurity may attend its commencement, yet no disease is more easily distinguished than this when farther advanced :—it exhibits the mournful and appalling picture of a child rolling its head on the pillow, or perhaps sawing the air with one hand while the other is paralyzed ; with a hectic flush on the cheek, the eyelids half concealing the pupil, and the eyes deprived of their vivacity by a filmy covering ; fixed dilatation of one or both pupils, with redness of the eye-ball ; drawing a long sigh ; frequently grinding the teeth ; quite incoherent or in a state of perfect insensibility ; a burning fever on the skin, perspiration forced from every pore, and all these symptoms alternating with, and at last finished by, palpitating breathing and violent convulsions.

This, then, is a disease of the most dangerous nature, and such as parents, on the instant of suspecting it, should endeavour to subdue by the promptest measures. These ought to be,—turpentine lavements, heating frictions over all the spine, leeches to the temples and forehead, cold poultices on the head itself, with stimulating ones over the stomach and bowels, and the employment of these remedies with the least possible disturbance of the hapless infant. Doubt, in such cases, should never be permitted to occasion delay :—there will be safety even in the error of using active means, where a milder course

might have been sufficient:—this malady soon passes from being impressible by unscientific expedients.

CUTANEOUS DISEASES.

Such affections of the skin as occur at the earliest period after birth may be brought first under consideration.

I. Jaundice, or the yellow gum of the nursery, usually appears in the first week of infancy:—it is accompanied with indifference to the breast, and yellowness of the skin and eyes, originating from absorption of bile into the blood. This state is generally quite simple and needs no interference beyond what the babe's comfort and health at all times require. When an infant so affected, has also a frequent cough with heavy breathing, and moans or cries, and writhes apparently from a sense of inward pain, or is convulsively agitated, and whose dejections are foul or dark, the bowels and biliary organs must be held as disordered and obtain instant attention.

Such cases yield to the turpentine-poultices laid warm on the belly, with frictions of the spine and mild lavements:—each of the latter may consist of sallad-oil with twenty or thirty drops of turpentine, and have the temperature of new-drawn milk. Nurses ought never to be led by their own views to throw medicine, however simple, into the stomachs of young babes:—it is far better to promote their desire of suck; to feed and physic them, indeed, with the beverage of nature's providing.

II. Mothers are familiar with the pimply eruptions which arise chiefly on the face, neck, and arms of their young ones.—In the white-gum, the pimples are minute, hard, whitish, and surrounded with a reddish circle:—in the red-gum, they have a scarlet hue, are distinct and

intermixed with small red specks and patches of the same colour; sometimes, they spread over all the body:—in the wild-fire rash, they are deep red, and rise in circular clusters, which occasionally remain solitary on an arm or cheek, but more generally change their situation, and re-appear in other parts:—in the pale gum-rash, they are large, smooth, shining, have a lighter colour than the skin, without any encircling blush:—and, in the tooth-rash, the red pimples have different sizes, and are crowding or in patches; a ring of redness encompasses the larger ones, to which a secondary crop often succeeds.

When such eruptions are connected with acidity or other morbid state of the digestive organs, they require the usual remedies. If the efflorescence be suddenly repelled by currents of air or cold bathing, the health may suffer derangement. On this incident happening, the patient should be sponged with warm water, or have a heating poultice laid on the breast and bowels, or be immersed in a warm bath:—these means, by reproducing the eruption, cure the constitutional illness. In all these varieties, the skin ought to be kept clean, and the natural perspiration promoted by frequent washings. Tooth-rash sometimes arises from indigestion or feverishness in the nurse; but it frequently has place when no such cause can be discovered. It may also be connected with a weak and irritated state of the bowels:—generally, however, it is one of the symptoms of painful dentition, and of course yields to the same treatment.—When any of these eruptions arise, let care of the vital functions, especially those of digestion and the insensible perspiration be redoubled.

III. Blisters may be raised on infants by unevenness of their dress or by neglect of personal comfort; and, in

older children, by the causes of impaired digestion, or exposure to an excess of natural or artificial heat. In the former, there is feverishness and increasing debility, requiring the use of external tonics, assisted by isinglass in the mother's milk:—in the latter, a mild emetic, followed by freedom of the bowels, is indicated. Each blister should be punctured with a clean needle; and, as the fluid oozes out, have the cuticle gently pressed down, so as to exclude the atmospheric air:—abrasion of the parts is then to be prevented by suitable precautions.

IV. Blotches and blains, having various sizes, colours, and shapes, arise on the persons of children, and usually end in dry crusts. Their colour is red, or yellow, or brown:—sometimes, they are large and solitary; sometimes, small, numerous and confluent, forming extensive clusters:—some of them contain a watery, others a cream-like fluid:—many excite itchiness; and many are painful.—Excess of animal food used by the nurse, full habit or improper nourishment of the child, and difficult teething constitute their principal causes.—Improvement of digestion, both in the nurse and her suckling, cleanliness, and exercise in the fresh air, promote the state of health under which they do not exist:—and, when such pustules degenerate into spreading sores, these must be often washed with an infusion of common tea, having much sugar and cream; and, in the interval, covered with the simplest dressings.—When cutaneous blotches are copper-coloured and rapidly become ulcers, emitting a foetid discharge, and at the same time appear in the mouth, throat, nostrils, eyes, and lower extremity of the bowels, they constitute sores which parents cannot manage, and proceed from sources which popular applications cannot purify or remove.

V. Skin-bound, in the domestic vocabulary, is a state incidental to children. Its progress is slow, and the tendency to it depends on some peculiarity which appears to be constitutional, and in many instances hereditary. At first, the skin assumes a dingy white or yellowish tinge; it is rough and especially about the face and neck, so attached to the subjacent textures as to be immovable over them. These appearances are accompanied with the feverish pulse, fitful breathing, irregularity of the bowels, listlessness and disregard of food, with coldness of the body and extremities, many parts of which are purple or otherwise discoloured.—Frequent sponging of the surface with warm whey or small beer, lavements containing turpentine or sulphur, frictions of the spine with sulphureous ointment; and, internally, milk of the ass, goat, or healthy hired nurse, with exercise, fresh air, and an under-dress of chamois-leather or flannel often changed, will assist in removing the causes of this obstinate affection.—If the disease exists at birth, or commences almost with infancy, the mother must decline nursing her babe, and the circumstance ought to draw attention to the state of the parental health.

VI. When Dandriff attacks infants, it shews itself on the forehead and temples as a slight whitish scurf composed of scabs, in the form of a crescent:—in other parts of the head, these are larger, flat and very thin:—occasionally, they cover nearly all the hairy scalp.—This affection does not long resist the effects of cleanliness and frequent washings of the parts, aided by care of the digestive, and indeed all the natural actions. When the scalp is seized, it should be shaved, and the scales removed with warm water and soap, or the soapy poultice, because they are often intermixed with impurities, and ves-

icles containing an acrimonious lymph form under their crusts.

VII. Six varieties of the Scall may be ranked among the diseases of children, and nearly similiar treatment is suitable to each of them :—this, therefore, will be introduced after the last kind has been described.

The Milky Scall begins on the forehead and cheeks as a thick eruption of minute, yellowish-white pustules crowded together upon a red surface :—they break and discharge a tough fluid which hardens into thin straw-coloured scabs. As the eruption spreads, this fluid continues issuing from beneath the scabs, increasing their thickness and size till the forehead and even the entire face, except the nose and eyelids, are quite covered. When the crusts fall off and cease to be removed, the cuticle appears red and delicate, but without a tendency to crack into fissures. Patches of the same kind rise also on the neck, breast, and extremities, and the disease runs on for many weeks. Unless when a troublesome itching interferes with the rest and impairs digestion, the constitution during all this time is little impaired :—when it fails, however, a foundation may be laid for general debility and even for obstruction and enlargement of the mesenteric glands. Often, the eruption has irregular returns, being apparently reproduced by difficult teething or other cause of irritation. When the disease is about to terminate, the child's urine acquires the smell of that voided by cats ; and it is generally of long continuance, when no tendency to this change of odour supervenes.

VIII. Children, from six months to five years, are liable to have the Scalled Head, which is another variety of this affection. Generally, it begins on the scalp, sometimes on the cheeks ; but, when the face becomes

affected, its ordinary course is from the scalp towards the cheeks by the line of the ears. The pustules are somewhat large and full of viscid matter:—their form is circular; their margin flattish and irregular; and, usually, they occasion much itching. By their discharge, the hair is often matted together, the scabs get thickened, the ulcers spread into the integuments, and the indurated patches seem, as it has been said, to be fixed upon a quagmire of offensive fluid. Forthwith, the lymphatic system exhibits marks of suffering irritation; and, on each side of the neck, the glands enlarge and harden, forming a chain of small tumours lying loose under the skin:—by and by, some of these inflame, the surface grows discoloured, and a slow and painful suppuration ensues. The glands under the ear and the chin, also sustain the same kind of inflammatory action:—even the ears themselves are occasionally thus affected, and from behind them as well as out of their inside, a foetid viscous fluid freely emanates. This fluid is acrimonious and affects whatever part of the body it lights upon:—hence, the disease frequently appears on the arms and breasts of nurses; and, in this way also, other domestics receive it by contagion. Its duration is uncertain, but generally not very tedious, unless when maintained by painful dentition or other source of excitement.

IX. Another variety, the Honey-comb Scall is so named from its being cellular and having a resemblance to honey-combs. The crusts, are soft, yellowish or greenish, and semitransparent:—their surface is irregular and indented. The pustules form on the trunk, face, and limbs; and the irritation from them excites the child to scratch and pick them, by which means the skin is kept raw and the sores extended. This happens particularly

about the heels and roots of the toes :—sometimes, the extremities of the latter ulcerate, and the pustules creep even under the nails.—Both from this and the last kind a very offensive odour is exhaled, and occasionally inflames the eyes of nurses and others who are necessarily surrounded by its vapour.

X. The Lupine Scall has crusts shaped like seeds of the plant which gives its name. It is characterized by dryness of the scabs, which rise in small clusters of minute pimples, the finer part of whose fluid is absorbed, while the remainder concretes and gives a white scaly powder in its central indentations :—on the head, the size of each scab is as large as a sixpence ; on other parts of the body it is much less :—the disease increases, if neglected, and usually runs a tedious course.

XI. Seated also in the scalp, is the Branny Scall which commences with an eruption of minute pustules containing a small quantity of fluid :—this is soon absorbed, and the excoriation or ulceration does not extend. This kind is apt to be renewed ; it causes a considerable degree of itching and soreness of the surface ; the hair partially falls off, becomes thin, less strong in its texture, and lighter in colour ; and the glands of the neck occasionally swell and are painful.

XII. Ring-worm Scall consists of very minute pustules forming circular clusters of a brownish or reddish colour. Sometimes, one patch only appears and the clusters are so small as to elude notice unless very closely examined :—nevertheless, a papular roughness is quite obvious. Very little fluid oozes from them, yet if neglected, it concretes into thin scabs which are tipped with green, while the patches expand in diameter and become confluent. From the first, the hair is injured, grows thinner and lighter,

and breaks off short; ultimately, the roots are affected: the plots grow bald; and, as this baldness extends, nothing remains but a narrow border of hair forming the outline of the scalp. This affection is contagious and sometimes is propagated with great rapidity.

Scall, exists under these six modifications,—from sores of some depth, emitting thick fœtid matter and having broad scaly crusts, to eruptions so minute as to be visible only with the aid of a glass, overspread with fine branny scales and discharging a thin purulent fluid, manifested rather by its effects than by its presence.—Management of the constitution by making the digestive functions healthy and the excretions natural, is essential to the right treatment of all these forms of the scall:—this will be obtained by the means already described. Warm bathing, on alternate evenings, is particularly requisite in this disease:—the hair likewise must be shaven off; and the scales daily removed. Locally, the soapy or yeast poultice, or one containing sulphur, and the quick-silver lotion, or a liniment of sulphur and cream, form the best and most convenient remedies:—they should be applied at bed-time, to the head after it has been well washed; and during the day, it may be covered with finely powdered arrow-root or starch.

XIII. Itch appears under various forms,—the papular, watery, pocky, complicated and mangy:—these, however, need not be described; their names imply their nature; and, to each, nearly the same remedies are appropriate.

This sordid malady manifests itself in an eruption of minute pimples, found chiefly between the fingers and in the flexures of the joints. It originates in personal uncleanness and an accumulation of impurities upon the

skin;—nevertheless, the most cleanly may receive it by contagion.—When recent, it may be cured in three days, by warm bathing and proper external remedies. With this view, the child ought to be first immersed in heated water and have all the body well cleansed with soap and a soft brush; and, after this, the affected parts should be rubbed with sulphureous ointment, or the hands washed, each night and morning for three days, in a specific lotion, some of which may also be applied with a clean sponge or hair pencil, to the pustules, wherever they have arisen:—a warm bath and general purification will complete the cure. Where the constitution has been affected, stomachic and aperient medicines will be requisite and ought not to be neglected.

XIV. Herpetic eruptions, in children, include the military tetter, the shingles and ring-worm:—they consist of vesicles in small distinct clusters with a red margin, and hold a fluid at first clear and then opaque:—they are characterized by an itching or tingling sensation, concrete into scabs, and sometimes continue for several weeks. In the former, new clusters succeed the preceding; the matter discharged from the vesicles is very tough and adhesive. Some constitutional affection accompanies the shingles in its first stage. Such red irregular patches of vesicles rise on the trunk, and enlarge to the size of small pearls:—they appear in successive clusters and often pass round the waist like half a sash; but sometimes, cross the shoulders as a sword-belt. On beginning to subside, the vesicles become confluent, grow darker, and terminate in thin blackish scabs. Ring-worm has its vesicles restricted to the circumference of a circular patch, the middle of which is slightly inflamed, becomes rough and dull red, and throws off scales leaving the surface

tender. Fresh crops of such circles spring up, and sometimes pass in succession over all the surface:—it is not contagious. Except when the constitution becomes affected no internal medicine is required in any of these varieties:—in such case, the diet should be plain, and mild cooling aperients with an occasional emetic will be useful. Externally, cooling lotions or poultices are preferable:—they may be replaced with applications of dry linen or carded cotton.

XV. Water-pox has a concomitant fever, and exhibits four varieties,—chicken-pox, swine-pox, globular-pox or hives, and the clustering water-pox,—distinguished chiefly by the shape of the pimples, which are pea-sized vesicles scattered over the body, smooth and transparent, rising in successive crops, and having a thin pellicle. About the third day from their appearance, they burst at their tops and concrete into small puckered scabs, rarely leaving marks in the skin.—The vessels of chicken-pox are irregularly circular, like lentile-seeds, and flattened at the top:—the fluid in them is originally clear, then whitish, and ultimately straw-coloured. Those of the swine-pox have a conical shape, and their fluid never changes from being pellucid; while in the hives, the pimples are larger and globated, and have their fluid at first whey-coloured and then yellowish. In the clustering water-pox, the vesicles congregate in groups upon a common but broader base, are redder in the early stage, and later of appearing:—in this kind, the febrile symptoms generally outlast the eruption which, in the three first varieties, arises chiefly on the back and the number varies from twenty to two hundred vesicles. Ordinarily the fever is slight, sometimes indiscernible. In the clustering water-pox, chiefly, the eruption is preceded by shivering, sick-

ness, head-ache, and pain in the limbs; but these symptoms always subside when the vesicles have appeared. Under such circumstances, the patient should be confined to a quiet, spacious and well aired room, have a cool dress, diluting drinks, low refreshing diet, tepid spongings of the body, and moderately active aperients.

Occasionally, several of these varieties are intermixed, and the fluid, about three days after the eruption, sometimes becomes thickish as well as yellowish, in the first and third kind, and has a purulent appearance; whence, they have been mistaken for small-pox. In chicken-pox, the eruptive fever is also sometimes considerable; and, hence, another cause of the same mistake, which has led to serious and even fatal consequences, by putting those who have had the disease off their guard against variculous infection:—where, moreover, this has been committed and the small-pox afterwards received, it has occasioned a second mistake, by inducing the patient to believe that he has had the small-pox a second time.

XVI. Vesicular fever exhibits a type allied to the typhous, and attacks infants most commonly in a few days from their birth, but may also occur at any period of their first year. It is accompanied with transparent vesicles whose margins are red, but not swollen, nor surrounded by an inflammatory blush:—they contain a clear or slightly coloured fluid, are irregularly oblong with flattened tops, and large as a filbert:—they arise on the neck and upper part of the breast, on the belly and groin and inner sides of the thighs:—and, they appear successively, break, and form tedious sores which often enlarge their boundary and wear out the little one with pain, restlessness, and want of sleep.—The cure consists in supporting the vital energies, by regulating digestion, excretion,

and perspiration. For these ends, the child may receive solutions of animal jelly or isinglass in milk of the sheep, goat, ass, or the mother, with some magnesia when there is acidity of the stomach, and have opening as well as nutritive lavements, comprising infusions of hops or the poppy when the bowels are pained and irritable:—frequent change of the dress, regular ventilation and freshness of the room, gentle exercise, and attention to the procuring a due proportion of sleep, are at the same time quite indispensable.

XVII. That variety of the Rose which assails recently born children is caused by want of cleanliness, impure air, and defective nourishment. It arises first on the extremities or near the navel, and frequently spreads far downwards:—the parts become hard and slightly swollen; assume an inflammatory blush which darkens into a livid hue; and are also occasionally covered with, or encircled by, purple spots. Sometimes, blisters rise on them; and these, on breaking, expose a foul raw surface that readily passes into a state of gangrene.—This affection is attended with much oppression, fever, and other symptoms indicating great danger:—it must be treated, in the first stage, by evacuating the bowels, by giving isinglass or other animal jellies in the mother's milk, by purifying and rubbing the person, and by sprinkling carbonate of zinc with flour in equal proportions, three times a-day, on the diseased surface.

XVIII. Rose-rash is often preceded by feverishness:—it rises first in the face, and soon passes over all the person, extending in small patches which vary in their figures, but are usually larger than those of measles. These, at first, have a bright red colour, but alternately acquire that of the damask-rose. Occasionally this affection appears

over the body in rose-coloured rings with central areas retaining the natural tints of the skin. Acidulated drinks, with laxatives and sometimes an emetic, generally remove it, when unconnected with an organic or constitutional malady:—if such be its origin, it proves obstinate and can be cured only by eradicating the primary disease.

XIX. Nettle-rash is generally attended with some disorder of the constitution. It is distinguished by a sense of itching and wheals like nettle-stings:—the eruption is florid and appears about the second day;—it fades and revives or wanders from place to place. Head-ache, drowsiness, coldness, and shivering, are succeeded by great heat and a white fur on the tongue:—sometimes faintness and anxiety, with sickness and pain in the stomach are present:—the concomitant fever is usually mild and remitting.

Cooling regimen and slightly acid drinks, gruels and soups, with free exposure to the pure air will often cure this disease without the assistance of medicine. It is always proper, however, to provide that the digestive organs be active and the skin moist. When the itching is urgent, weak spirits of hartshorn, vinegar, the juice of fresh parsley, or refrigerant poultices, shall be successfully applied to the parts.

XX. Measles has for its opening symptoms, some degree of hoarseness, with dry harsh cough and uneasy breathing; the eyelids swell; the vessels of the eye grow turgid and red; hot tears moisten and pain the cheeks: the nostrils are loaded with an acrid fluid which irritates them and occasions sneezing; there is symptomatic fever, quick pulses, parched skin, drowsiness or head-ache; and the stomach, by sympathy, rejects its contents. On the fourth day, a crimson rash appears as dotted specks

grouped in circles or crescents:—sometimes the dots are attended with a general flush giving the appearances of scarlet fever:—about the seventh day, the redness diminishes, and the specks fall off in branny scales which are scarcely perceptible:—and, by the eleventh, or even earlier, no trace of measles remains. When the treatment has been improper, or there is a predisposition to consumption from a strumous or other morbid state of the lungs, the eyes continue to be inflamed and the cough is followed by severe symptoms which should never be regarded with indifference.

So soon as the disorders that introduce the measles shall have attracted notice, a mild emetic will produce beneficial effects, which should be supported by aperients, sponging the body with tepid water, and the other means usually employed for keeping the skin moist and the bowels free. When the cough is troublesome, there will be advantage in breathing the steam of warm water from a capacious basin while the head is covered with a piece of flannel large enough to hang over its edges:—this last also, affords the inflamed eyes the benefit of the relaxing vapour. If oppression of the chest, with pain and coughing, should return when the eruption has disappeared, large heating poultices ought to be placed on all the breast or shoulders, and activity of the excreting organs promoted. Throughout the disease, the bed-room should be spacious and airy, and protected from currents of air, but not hot; the drink warm, the food light, liquid and diluent. Moderate looseness, supervening naturally, is favourable and should not be rashly interrupted.

XXI. Scarlet Fever most frequently attacks children and, when mild, is only slightly contagious:—occasionally, it is epidemic, and then occurs usually at the close of

summer. Its first symptoms are those of a moderate fever; but, on the second day, numerous specks or minute patches of a vivid red colour appear on the face and neck; and, within the next twenty-four hours, a like rash is diffused over the surface of the body:—this, sometimes even tinges the inside of the lips, cheeks, palate, and entrances into the throat. The eruption may be universal; but more generally on the trunk, there are intervals of a natural hue between the patches, with pimply dots scattered over them. Towards evening the fever increases, and the rash is most florid:—in the morning both these symptoms diminish. On the fifth day, the eruption begins to decline; the interstices widen and the scarlet hue fades:—on the sixth, it is very indistinct; and, by the seventh, can no longer be perceived.

During the eruptive stage, the pulse is usually very quick and feeble, the tongue covered with a whitish fur in the middle, and often interspersed with scarlet specks, while its sides are dark red and the face considerably swollen. There is also much anxiety and restlessness, with a sense of tingling or itching in the skin; and sometimes, in the evening, a slight degree of mental wandering supervenes. Occasionally the fever runs high, but in most cases it is moderate:—it seldom becomes alarming; and the other symptoms often pass away without causing much inconvenience.

Slight cases of scarlet fever scarcely ever require medical assistance. When the accompanying fever is mild, it forms the natural means of cure by determining the specific principle of the disease to the surface. In promoting this determination, a gentle emetic will often be found serviceable:—the face, neck, and indeed all the person, with the back and extremities should be often

sponged with water a little warmer than the body:—and if the bowels be confined, a course of moderate evacuation should follow; but violent purging must be avoided, as it augments the irritation and may otherwise induce very undesirable effects.—Aggravated cases, accompanied with ulcerated sore throat, late and defective eruption, often changing to a livid hue, are highly contagious and fraught with danger:—such, by obvious consequence, demand the highest resources of experience.

XXII. Small-pox is now a rare malady:—when it incidentally appears under its natural or modified characters, it is ushered in by an inflammatory fever, and sometimes by a convulsive paroxysm. These symptoms, however, and the eruption as it advances, require being treated by the usual applications of cold water to the surface, acidulous drinks, fresh air, cooling diet, and opening medicines.—Inoculation for small-pox ought never to be practised; because the security it affords can be obtained equally well from cow-pox and is more than counterbalanced by its becoming the source of a wide-spreading contagion, which it may be difficult to avoid and which it is certainly impossible to control.

XXIII. Cow-pox is propagated by vaccination, and except in a few particular constitutions whose exact characters have not yet been ascertained, affords security from the variolous contagion.

Vaccination ought never to be performed on a child who is not in the best health and has all the surface quite entire:—chaps and sores behind the ears or on other parts, and eruptions of every kind, prevent the affection by cow-pox from producing its full and salutary effects. This operation should, on no account, be entrusted to any one but a person of much practical experience:—neither

ought parents to venture on deciding when the artificial disease has been perfect. The infantile economy is seldom in the fittest state for imbibing the vaccine principle during the first month; but, after this period, becomes progressively more susceptible of it, and seldom requires any preparatory measures.

Perfect cow-pox has the following signs,—the vesicle is confined to the puncture, cellular, and bluish-brown in the centre; the fluid remains clear and colourless to the last, and concretes into a hard, dark-coloured scab, after the twelfth day. For propagating the disease, the fluid should be taken from the vesicle at as early a period before the ninth day as it can be obtained:—after this, it is usually too inactive to determine the expected results. If the fluid be not transparent, this forms a decisive proof of its being either spurious or imperfect. The puncture should be made as superficial as possible; for, if much blood oozes from it, the vaccine matter may suffer so great a degree of dilution as to be thereby rendered ineffective, or entirely washed away.

Successful vaccination produces a train of local and constitutional effects. Soon after insertion of the fluid, the puncture disappears; but, on the third day, a minute inflamed dot becomes visible:—this gradually increases in size, hardens, and forms a small round swelling slightly elevated above the skin. About the sixth day, the centre of this shows a discoloured speck originating from the secretion of a minute quantity of fluid:—this speck augments and becomes a minute vesicle, which continues to fill and be distended till the ninth day, when it displays, in perfection, the peculiar features that distinguish it from the inoculated variolous pustule. It is circular, sometimes oval; but the margin is always well defined, and

never rough or jagged, while the middle dips instead of rising, and is less elevated than the circumference.

When the vesicle is complete, about the eighth day, the disease exhibits something of a constitutional influence; the arm-pit feels painful; there is great heat in the head; and shivering, lassitude, loss of appetite, with accelerated pulses, usually supervene. These symptoms may exist for one or two days but always subside spontaneously, without leaving any unpleasant consequence. During the general indisposition, the vesicle on the arm is surrounded with an inflamed circle, an inch or more in diameter:—this is the proof of constitutional affection, however slight may be the internal symptoms. After this period, the vesicle gradually dries up; its encircling blush becomes fainter; and, in a day or two, dies away imperceptibly, so as seldom to be distinguishable beyond the thirteenth day after inoculation. At this time, the vesicle hardens into a thick crust having a brown or mahogany colour; and, if not separated antecedently by violence or accident, falls off spontaneously in about a fortnight, leaving the skin beneath perfectly sound.

Vaccination has failed in a very few cases,—8 out of 66,000—but, in almost every instance, the small-pox occurring after it, has been changed from its natural course and rendered milder as well as of shorter duration:—in these instances, the pustules rarely exceed the fifth day before they begin to turn; and the fluid in them generally passes at once from the limpid into an indurated state. While, therefore, the absolute infallibility of the preventive powers of cow-pox inoculation cannot be maintained, enough still remains to prove its being one of the most important discoveries in medicine, and one of the greatest blessings that has ever been conferred on mankind.

PREScriptions.

In the following List, the simple remedies, as the solutions of salts, infusions of senna, chamomile tea, and the like, are not comprehended:—neither has it been judged necessary to include any of those, as the alum poultice and others, which have been described in the preceding pages:—the stated proportions can be lessened or increased according to the patient's age.

I. Take of

Cream of Tartar, two drachms,
Manna, half an ounce,
Warm Water, four ounces,
Syrup of Orange-Peel, two teaspoonsful,
Essential Oil of Oranges, 6-10 drops:

Mix and dissolve them into a draught, whereof one-half is to be given at bed-time, to a child of 4-8 years, and the remainder early next morning.

II. Take of

Magnesia (calcined), ten grains,
Rhubarb or Jalap, powdered, 5 grains,
Cascarilla-bark, powdered, 15 grains,
Arrow-root, a tablespoonful,
Refined Sugar, a sufficiency:

Mix and rub them together so as to make a uniform composition; then, with water, make it as usual into a jelly; and, when cooled, add two or more teaspoonsful of the pulp of tamarinds, thin part of marmalade, or any aromatic syrup.

III. Take of

Phosphate of Soda, half an ounce,
Boiling Water, a sufficiency,
Arrow-root, a tablespoonful:

Dissolve the soda in what water will be required for the arrow-root; then, with the solution, make the jelly as usual; and add as much treacle, or pulp of tamarinds, or aromatic syrup as may be agreeable, for a child of 8-10 years.

IV. Take of

Powder of Rhubarb, one drachm,
—— Common Mustard, 5-15 grs.
—— Canella Alba, 30 grains,

Mix and rub them intimately together; then, after fomenting all the region of the bowels with hot water so as to produce redness, sprinkle the powder over the parts while yet moist; and

cover the whole with a large poultice as warm as can be endured:—applied at bed-time, this generally excites the bowels of children under ten years of age.

V. Take of

Opium, minutely powdered,
Common Mustard, of each, 5-10 grains,
Arrow-root or starch, one drachm:

Rub them together so as to make a fine powder, and apply it as in the preceding:—it relieves griping and internal pain.

VI. Take of

Powdered Rhubarb or Jalap, 10-15 grs
Manna, two or three drachms,
Arrow-root, a tablespoonful,
Refined Sugar, a sufficiency:

Mix by intimately rubbing all the ingredients together in a mortar; then make them into a jelly with milk or water in the usual manner; and, when cooled, add what may be desirable of the pulp of tamarinds, fluid part of marmalade, treacle or even wine with a few drops of the essential oil of oranges or lemons:—this dose is sufficient for a child of ten years.

VII. Take of

Rhubarb sliced, two ounces,
Canella Alba, bruised, two drachms,
Whisky or Brandy, a wineglassful,
Best Sherry Wine, an English pint:

Macerate these ingredients for seven days, and strain through unsized paper:—three or four teaspoonsful for children after their second year.

VIII. Take of

Senna-leaves, finely powdered, one oz.
Pulp of French Prunes, four ounces,
—— Tamarinds, half an ounce,

Treacle or Simple Syrup, an english pt.
Essential Oil of Caraway, thirty drops :

Boil the pulps in the treacle, to the thickness of honey; then add the powder and, when the mixture cools, the oil; lastly, mix the whole intimately so as to form an electuary, whereof a small teaspoonful, at bed-time, may be given to children of 3 or 4 years.

IX. Take of

Senna-leaves, two or three drachms,
Preserved Tamarinds, one ounce,
Coriander-seeds, bruised, one drachm,
Brown Sugar, half an ounce,
Boiling Water, half an English pint :

Macerate for four hours, with occasional agitation, in a close earthen vessel not glazed with lead, and strain the infusion:—two tablepoonsful make a dose for children in their third year:—its strength may be increased by adding an ounce of the phosphate of soda after being strained;—with the tamarinds, cream of tartar forms an improper combination.

X. Take of

Down of the Cowhage-pods, 5-10 grs.
Syrup of Roses, treacle or jelly, a suf.

Mix them by gentle stirring, and give the same dose to a child of six years, for three successive mornings, on an empty stomach; and, after the last, a smart purgative of senna, castor-oil or rhubarb, should be given:—for worms.

XI. Take of

Carolina Pink, finely powdered, 30-40 grs.
Powder of Jalap, five grains,
Arrow-root, a tablepoonsful,
Refined Sugar a sufficiency :

Rub them into a uniform powder, and then make the jelly as usual, adding some sherry wine:—give this dose at bed-time to a child of 4-6 years, and complete its operation by giving a draught, next morning, of the senna-infusion.

XII. Take of

Spirits of Turpentine, 2-6 drachms,
Fresh Cream, a wineglassful,
Essential Oil of Peppermint, 2-4 drops.

Shake briskly in a phial, so as to mix them well, and cause the draught to be swallowed suddenly:—give it at bed-time to a child of six years, and bring it away next morning with some castor-oil:—double this quantity will be required for a lavement.

XIII. Take of

Powdered Ipecacuan, 10-15-20 grains,
Lavender or Cinnamon Water, 4 oz.

Mix by brisk agitation, and give it as a draught for a child of 6-10 years, as directed in a former section.

XIV. Take of

Ipecacuan-root, bruised, one ounce,
Spanish White Wine, an English pint :
Macerate for a week, and filter the fluid through soft paper:—it is best for the use of children; see p. 213 of the work.

XV. Take of

Fine Sulphate of Zinc, 10-20 grains,
Peppermint or Lavender Water, 1 oz.
Refined Sugar, a sufficiency :

Dissolve the zinc and sugar; then make the child of 6-12 years to gargle the mouth with a teaspoonful of salad-oil or melted fresh butter; and lastly cause the draught to be rapidly swallowed:—it produces instant vomiting, and is perfectly safe.

XVI. Take of

Pure Opium, one drachm and a half,
Soft or Rain Water, heated, 1 eng. pt.

Mix and rub in a mortar till the opium is dissolved, and filter through linen:—this lotion soothes painful sores and ulcers of every description; but it is particularly beneficial for allaying the gripes and internal pains of children, when made into a poultice and laid warm on the belly, or exhibited in a lavement:—this quantity is sufficient for six poultices, and a tablepoonsful will make a lavement, to children of 3-6 years.

XVII. Take of

Best Opium, half an ounce,
Cinnamon, bruised,
Cloves, bruised, of each a drachm,
Sherry-wine, half an English pint :

Macerate for eight days, and filter through paper:—this is every way preferable to laudanum:—the dose, to children of six years, is 5-10-15 drops when indispensably necessary, which is very seldom the case.

XVIII. Take of

Lime Water, one English pint,
Muriate of Quicksilver, one drachm ;
Mix :—tettors, ring worms, and other cutaneous affections sometimes yield to this application, which will bear being diluted.

XIX. Take of

Muriate of Ammonia, half an ounce,
Strong Vinegar, and
Best Whisky or other spirit, of each, one English pint :

Mix and dissolve the muriate, —it is a very effectual application to sprains, contused swellings, and recent tumours in the joints:—in some persons, it ought to be heated; in others, cold:—made into a poultice, it is very powerful.

XX. Take of

Sulphate of Zinc, half a drachm,
Warm water, half an English pint :

Mix, and when cold, strain through linen; then add two table-spoonsful of the vinous tincture of opium:—it is cooling and cleansing, and relieves the pain of inflamed eyes.

XXI. Take of

Bruised Nut-galls, two drachms,
Boiling Water, one English pint.

Mix and macerate for an hour, and then strain the liquor:—it cleanses cutaneous sores; and, with a fourth part of vinous laudanum, tends to allay the irritation of piles.

XXII. Take of

Muriated Quicksilver, one drachm,
Rose-water, half an English pint,
Muriate of Ammonia, two drachms,
Purified Nitre, half an ounce :

Dissolve the quicksilver in the water then add the ammonia and nitre:—this is the most elegant application to that most inelegant affection,—the itch! The hands are to be washed with the solution night and morning, and a little of it should be applied with a clean sponge to the pustules in other parts.

XXIII. Take of

Water of Ammonia, one part,
Olive or Sallad Oil, three parts,
Volatile Oil of Rosemary, ten drops :

Mix by shaking in a phial:—its properties are stimulating, and thus proves useful in sore throats with relaxation, in sprains, and in stiffness of the joints.

XXIV. Take of

Strongest Quicksilver Ointment, $\frac{1}{2}$ an oz
Purified Hog's Lard, one ounce,
Camphor in fine powder, two drachms,
Best Whisky or otherspirit, two ounces,
Water of Ammonia, one ounce :

Dissolve the camphor in the spirits, then add the ammoniated water and the ointment previously mixt with the lard:—it quickens absorption and stimulates the surface; its effects are considerable when rubbed over the spine.

XXV. Take of

Olive, Linseed, or Sallad Oil,
Lime Water, of each, six ounces,
Whisky or other weak spirit, one oz.

Mix them by careful agitation:—it is applicable to humors and scalds where the cuticle has not been abraded.

XXVI. Take of

White Soap, two ounces,
Oil of Almonds, four ounces,
Sulphuret of Potass, three drachms,
Essential Oil of Thyme, 10-20 drops :

Mix them intimately:—this liniment, used twice a-day, cures the itch in a week.

XXVII. Take of

Purified Oil of Amber, one part,
Nitrous Acid, four parts :

Add the acid to the oil in small portions at a time, stirring them together with a glass-rod till the oil be converted into a yellow resin, having the smell of musk:—this is the Artificial Musk, and may be rubbed on the spine of children, in many cases, with much advantage.

XXVIII. Take of

Palm or other Aromatic Soap,
Refined Sugar, half an ounce,
New or warm milk, of each a suffi.
Purified Sulphur, two ounces :

Dissolve the sugar in the milk, then make a thickish lather by rubbing the soap in this solution, and lastly incorporate the sulphur by mixing it well with the other ingredients, in a mortar:—it may be used for many of the cutaneous eruptions.

XXIX. Take of

Bay-berries or white hellebore, in powd.
Sulphur,
Sulphate of Zinc, of each, half an ounce,
Rose-Water,
Olive, or Sallad Oil, of each, a suffi.
Essence of Bergamot, 10-20 drops :

Use as much rose-water as the powders will absorb, then mix them with the oils:—this answers the same purposes as the last.

XXX. Take of

Submuriate of Quicksilver, 2 drachms,
Dried Sulphate of Alum,
White Oxide of Lead, of each, $\frac{1}{2}$ a dr.
Venetian Turpentine, six drachms,
Spermaceti Cerate, an ounce and a half,
Essential Oil of Lavender, 10-20 drops:

Mix intimately and make an ointment, which cures Scalled Head and Herpetic eruptions.

XXXI. Take of

Nut-galls or Kino, two drachms,
Camphor, half a drachm,
Opium, one scruple,
Prepared Hog's Lard or palm oil, 2 oz.
Essential Oil of Thyme, 5-10 drops :

Mix, by rubbing together the ingredients, the three first being previously reduced to the finest powder:—it is a good application to piles, after their inflamed state has been diminished by cooling lotions or poultices or leeches.

XXXII. Take of

Purified Hog's Lard, half an ounce,

Prepared Oxide of Zinc,
Armenian Bole, of each, two drachms,
White Precipitated Quicksilver, 1 dr.

Mix them intimately:—it removes or mitigates disease of the eyes or eyelids, especially when aided by an occasional emetic.

XXXIII. Take of
Camphor, in fine powder, 2 drachms,
Palm Oil, four ounces.

Melt the oil, and when almost cold, mix the camphor by rubbing them together in a mortar:—it is applicable to indurated or scrofulous swellings under the jaw.

XXXIV. Take of
Sweet Wort of beer or porter,
Oatmeal, of each a sufficiency:
Stir the meal into the liquor till the mixture be of a proper consistence, and then add a tablespoonful of yeast:—this is the effervescing poultice; it cools and cleanses various sores; it should not be too tightly applied.

XXXV. Take of
Finely powdered Kino, 10-15 grains,
———— Rhubarb, 5-10 grains,
———— Gum Arabic, 1 dr.
———— Cascarilla-bark, 10 gr.
Arrow-root, a tablespoonful,
Refined Sugar, a sufficiency:

Mix them intimately, then make into a jelly with milk, and when cooled, add some port-wine:—it moderates the actions of the bowels when excessive:—this dose is sufficient for children of eight to twelve years.

XXXVI. Take of
Red Rose petals, hastily dried, one oz.
Boiling Water, half an English pint,
Clarified Honey, ten ounces:

Macerate the petals in the water, for six hours; then mix the honey with the strained liquor, and boil the mixture to the consistence of a syrup, removing the scum:—it makes a cooling gargle for specks, ulcers, and inflammation of the mouth and throat.

XXXVII. Take of
Borate of Soda, one drachm,
Clarified Honey, one ounce:

Mix, by stirring them till the borax is dissolved:—this is the honey of borax, and may be applied with a hair-pencil to ulcers in the mouth.

XXXVIII. Take of
Fresh petals of the 100-leaved rose, 4 oz:
Boiling Water, one English pint,
Refined Sugar, twelve ounces:

Macerate the petals in the water, for twelve hours; then to the strained infusion add the sugar, and boil them into a syrup:—this is the common Syrup of Roses, which, in doses of a desert-spoonful, makes an agreeable and mild aperient for children.

XXXIX. Take of
Balsam of Tolu, half an ounce,
Boiling Water, half an English pint,
Refined Sugar, one pound:

Boil the balsam in the water, for half an hour, in a covered vessel stirring it occasionally; strain the liquor when cold; then add the sugar and boil the mixture into a syrup:—this is the balsamic Syrup, one or two teaspoonsful of which form a dose, in coughs and confinements of the chest.

XL. Take of
Fresh outer rind of Seville oranges, 2 oz.
Boiling Water, one English pint,
Refined Sugar, two parts:

Macerate the rind in the water for twelve hours; then add to the filtered liquor the sugar finely powdered; and with a gentle heat boil the whole into a syrup:—it is a convenient vehicle for medicine.

XLI. Take of
Fresh Violets, one part,
Refined Sugar, eight parts,
Boiling Water, four parts:

Macerate the violet, for twenty-four hours in a covered glass or glazed earthen vessel; then strain without pressure, and to the liquor add the sugar powdered, so as to form a syrup:—two or more tablespoonsful of this Syrup of Violets, proves a gentle laxative to children.

XLII. Take of
Expressed Castor-oil, a tablespoonful,
Soft or rain water, 3 tablespoonsful,
Ess. Oil of cinnamon or peppert. 5-10 d.
Solution of Potass, 15-20 drops:

Mix them carefully and give the draught to a child of three to six years.

XLIII. Take of
Essential Oil of Cinnamon,
Refined Sugar, one ounce or more,
Pure Soft Water, a chopin,
Whisky or Brandy, one wineglassful:

Drop the oil on the sugar and dissolve this in the spirits; then add the water by degrees, and when the sediment has subsided, pour the cinnamon-water into a bottle for use: any other aromatic water can be made in the same way.

XLIV. Take of
Essential Oil of Lavender, 15-30 drops
Best Old Whisky, one English pint,
Soft Water, half that quantity:

Drop the oil into the spirits and add the water; then remove the turbid appearance of the fluid by dissolving in it a very little of the carbonate of potass; and lastly, pass it through filtering paper:—after the same manner, any other aromatic spirit may be prepared.

GLOSSARY.

- Abdominal, a.* relating to the abdomen or belly.
- Absorbents, s.* vessels in the body, which imbibe the chyle and other particles of matter.
- Acescency, s.* a tendency to sourness.
- Acridness, s.* what causes a hot bitter taste.
- Adolescence, s.* the stage of life succeeding childhood, youth.
- Affusion, s.* the pouring of water on the body.
- Agitative, a.* having the power of moving or shaking any thing.
- Albuminous, a.* having the property of being coagulable by heat and other chemical agents.
- Alcoholic, a.* consisting of rectified spirit.
- Alkaline, a.* having the qualities of those substances which, when mingled with acids, produce ebullition and effervescence.
- Alternating, n.* changing by mutual successions.
- Alvine, a.* forming a part of, or belonging to, the bowels.
- Ammoniacal, a.* having the properties of ammonia or spirits of hartshorn.
- Ambient, a.* inclosing on all sides.
- Animative, a.* having the power of giving or supporting life.
- Analytically, ad.* so as to separate compound bodies into simple.
- Analogous, a.* having relation, resemblance, proportion, or parallel to something else.
- Appreciable, a.* capable of having a price or value set on it.
- Apoplectic, a.* relating to, or seized with an apoplexy.
- Arterial, a.* contained in the arteries or vessels which carry the bright red blood.
- Assimilative, a.* having the power of converting food to nourishment.
- Athletic, a.* sinewy, strong of body.
- Atony, s.* want of tone or vital tension.
- Atrophy, a.* emaciation or leanness proceeding from defect in the quantity, quality, or application of the nutrient part of the blood.
- Auricles, s.* two muscular bags at the base of the heart are so named.
- Azote or Nitrogen, s.* an elementary principle which constitutes four-fifths of the volume of atmospheric air: it has no smell or taste, extinguishes flame, and is fatal to animal life.
- Benzoic, a.* having the properties or peculiar acid furnished by the resin of the benzoin-tree.
- Boracic, a.* relating to borax, or the acid of which this salt forms the base.
- Buoyant, a.* floating or swimming on the surface.
- Butyric, a.* relating to butter or the acid it yields.
- Caliber, s.* the bore or longitudinal cavity of a thing.
- Caloric, s.* that simple fluid to which the production of heat and combustion is referred.
- Capillary, a.* small as hairs: the last branches of living vessels are so named.
- Capsule, s.* a membranous production inclosing a part of the body as a bag.
- Carminative, s.* substances which allay pain and expel flatulency.
- Carbonated, a.* containing carbon or the pure inflammable part of charcoal, or the black residue of vegetable matters whose volatile principles have been entirely dissipated by heat.
- Cartilage, s.* gristle, a white elastic glistering substance growing to bones.
- Catarrh, s.* a cold in the head, with increased discharge of a watery fluid from the nose.
- Cellular, a.* consisting of cells; a membrane composed of layers and fibres variously joined together, forms the connecting medium in every part of the body.
- Cerebel, s.* the small brain, situated in the hindmost and lowermost part of the head.
- Cerebral, a.* relating, or belonging, to the brain.
- Cervical, a.* situated in, or belonging to, the neck.
- Chalybeate, a.* impregnated with iron.
- Chronic, a.* diseases are so named when they are of long duration, and mostly without fever.
- Chyle, s.* the milk-like fluid separated by particular vessels from the chyme or mass of food after it has passed, in digestion, through the stomach into

- the upper portion of the small intestines.
- Coagulable*, *a.* capable of being concreted or curdled.
- Concentration*, *s.* compression into a narrower compass, or space round a centre.
- Concussive*, *a.* having the power of shaking or agitating.
- Configuration*, *s.* the form of the various parts of a thing as they are adapted to each other.
- Congestion*, *s.* an unnatural accumulation of blood or other fluid in a part of the body.
- Conglutinate*, *v.* to make to coalesce or re-unite.
- Constriction*, *s.* the state of being caused by some quality, as cold, to shrink or be drawn into a narrower compass.
- Contagioned*, *p.* retaining or emitting the matter by which disease is communicated from one person to another.
- Contractile*, *a.* possessing the power of shortening itself.
- Contra-indicate*, *v.* to forbid the use of a remedy which the main scope of the disease might seem otherwise to require.
- Convalescence*, *s.* the state of recovering from a disease.
- Convolution*, *s.* on the surface of the brain are inequalities representing serpentine ridges, between which are waving furrows, very deep in some places and narrow: these are the convolutions of the brain.
- Cortical*, *a.* resembling bark or having its brownish colour.
- Cranial*, *a.* belonging to the skull.
- Curvature*, *s.* the state of being bent or crooked.
- Cutaneous*, *a.* belonging to, or being in, the skin.
- Debility*, *s.* languor, febleness, or weakness occasioned by disease.
- Declamation*, *s.* the act of pronouncing a set oration, or popular address.
- Decomposition*, *s.* the separation of the component parts or principles of bodies from each other.
- Dejection*, *s.* a discharge from the bowels produced by opening medicines.
- Deleterious*, *s.* hurtful, unwholesome, poisonous.
- Dentifrice*, *s.* a powder used for cleaning the teeth.
- Dentition*, *s.* the act or time of breeding the teeth.
- Deposition*, *s.* the act of laying any thing down or on another.
- Desquamation*, *s.* the act of throwing off the cuticle or scarf-skin.
- Development*, *s.* gradual and systematic enlargement.
- Diaphanous*, *a.* pervious to the light, clear, transparent.
- Diaphragm*, *s.* a strong broad muscle which separates the chest from the belly; the mid-riff.
- Diffusive*, *a.* that may be spread, poured, or scattered every way.
- Discrepancy*, *s.* contrariety of sentiment; difference of physical qualities.
- Economy*, *s.* system of the human body, wherein every thing is arranged in its proper place.
- Elaborate*, *v.* to finish with great labour and contrivance.
- Electrified*, *a.* possessing the properties, or affected by the influences, of the electric fluid.
- Embryonic*, *a.* being in embryo or the state not yet fit for production.
- Emulsion*, *s.* a milky medicine in which oils and other substances, insoluble in water, are mixt with, and suspended in watery fluids, by means of viscid substances.
- Envelope*, *s.* the outward covering with which any thing is invested.
- Equilibrate*, *v.* to make or keep equally balanced.
- Erysipelatous*, *a.* affected with, or having the nature of the local disease, in common language, named the *rose*.
- Evolution*, *s.* the act of being unfolded or brought into its destined position.
- Exacerbation*, *s.* the most intense paroxysm of a disease.
- Excitability*, *s.* the quality of admitting sensitive impressions.
- Excretion*, *s.* the act or function of separating useless substances and ejecting them from the body.
- Excreting*, *a.* performing the functions of excretion: the bowels and urinary passages are the chief.
- Exhalation*, *s.* this term is nearly synonymous with the insensible perspiration.
- Expansive*, *a.* that may be spread into a wider surface or greater space.
- Expiration*, *s.* that act of breathing by which the air is sent out of the lungs.
- Exillation*, *s.* the act of issuing by drops, or minute globules.
- Extravasated*, *a.* having escaped, or been forced from its proper containing vessels.
- Exudation*, *a.* the act of emitting moisture through the pores, after the manner of perspiration.
- Familiarize*, *v.* to make well known by frequent practice or custom.
- Farinaceous*, *a.* having the nature or qualities of meal or flour.

- Febrile*, *a.* constituting a fever; exhibiting the characteristic symptoms of fever.
- Fibril*, *s.* a small fibre which itself is one of the constituent parts of bodies.
- Fibrillary*, *a.* consisting of fibrils or little fibres.
- Fibrine*, *a.* a peculiar organic compound formed both in animal and vegetable substances; it exists in the chyle and the blood, and forms the chief part of the red thready or muscular flesh.
- Filamentous*, *a.* consisting of filaments or fibres, which are long slender substances like threads.
- Follicle*, *s.* a minute cavity in animal structure.
- Fontanel*, *s.* this word is described at p. 7, note.
- Function*, *s.* the office of any particular part of the body; that of the lungs is to perform the acts of breathing.
- Gangrenous*, *a.* affected with gangrene, which is the first stage of mortification.
- Gastric*, belonging to the stomach.
- Gaseous*, *a.* having the nature of gas; the name given to all permanently elastic fluids, except the atmosphere, to which the term air is appropriated.
- Germ*, *s.* the part of animals and vegetables which lives and grows.
- Gibbosity*, *s.* the state of projecting, as in persons having high shoulders or a protuberant breast.
- Gelatinous*, *a.* possessing the qualities of gelatine, the well known animal substance usually denominated jelly.
- Grauminivorous*, *a.* that eats and lives on grass.
- Hæmorrhagy*, *s.* a preternatural discharge of blood.
- Hectic*, *a.* that fever which accompanies the last stage of consumption.
- Hepatic*, *a.* belonging to the liver.
- Herpetic*, *a.* affected with the cutaneous disease indiscriminately named tetters, shingles, and ring-worm.
- Hibernating*, *s.* sleeping through the winter.
- Iubrown*, *v.* to obscure or darken, to make brown.
- Imbued*, *a.* deeply tinged or impregnated with some quality.
- Impressionability*, *s.* the state of being susceptible of admitting impressions.
- Impressive*, *a.* having the power of communicating impressions.
- Impulsive*, *a.* possessing the faculty of producing effects from the action of one body on another.
- Individuality*, *s.* that mode of existence which distinguishes one individual from all others of the same species.
- Indiscriminating*, *a.* not exercising the act of distinguishing one thing or person from another.
- Inertitude*, *s.* indisposition to action or motion, sluggishness, inactivity.
- Influentia*, *a.* capable of imparting influences, having the power of directing to any purpose.
- Innutritious*, *a.* wanting the quality of nourishing or supporting by food.
- Instinct*, *s.* the power which acts in the mind without the intervention of reason or deliberation.
- Inodorous*, *s.* destitute of the qualities which affect the sense of smell.
- Intensity*, *s.* the state of being raised to a high degree; having the qualities that make it exquisite of its kind.
- Interchangeable*, *a.* following each other in alternate successions.
- Intermediacy*, *s.* the state of being in the middle place or degree between two extremes; forming the means of communication between two objects or states.
- Intermissive*, *a.* coming in fits, having periodical returns.
- Intertropical*, *a.* placed or residing between the tropics.
- Insomnolency*, *s.* want of inclination to sleep.
- Insolation*, *s.* state of being exposed to the sun's influences; the effect of exposure to the sun's action in excess.
- Irritability*, *s.* the susceptibility of being put in motion or disorder by means of external or unaccustomed contact.
- Lactiferous*, *a.* producing or carrying milk.
- Lobulated*, *a.* possessing lobes or distinct parts, as in the lungs.
- Locomotive*, *a.* having the power of locomotion, or of removing from one place to another.
- Lesion*, *s.* disease of a part or organ, where its substance is implicated.
- Lethargic*, *a.* affected with morbid drowsiness.
- Lymphatic*, *a.* small tubes or vessels conveying the lymph or colourless fluid, in living bodies, are so named.
- Mammiferous*, *a.* having teats or breasts adapted to the suckling of offspring.
- Mammary*, *a.* relating to the female breast.
- Medicament*, *s.* any thing applied externally for the purpose of healing.
- Medullary*, *a.* consisting of marrow, or having the nature of that substance.
- Membranous*, *a.* consisting of membrane, which is a web of fibres interwoven together, for inclosing or covering some parts of the body.
- Miasm*, *s.* an infectious or contagious particle of putrid matter.

- Misposition*, *s.* state of being placed in a wrong situation.
- Morbid*, *a.* constituting disease, being diseased, indicating disease.
- Mortification*, *s.* the state of losing its vital properties, followed by putrefaction.
- Motive*, *a.* having the power of putting into motion or action.
- Mucilaginous*, *a.* having the nature of mucilage.
- Mucous*, *a.* consisting of mucus, which is one of the primary animal fluids: that secreted by the membrane lining the nostrils comes most frequently under observation.
- Narcotic*, *a.* producing stupefaction, drowsiness or sleep.
- Nascent*, *a.* about to be born, advancing towards its birth.
- Nervous*, *a.* having the nerves in such a state of preternatural excitement as to constitute a disease.
- Obesity*, *s.* the state of being incumbered with fatness, excessive bodily bulk.
- Ophthalmia*, *s.* disease, chiefly inflammation, of the eyes.
- Organ*, *s.* a part of an animal or vegetable body appropriated to the performance of some particular function, as the eye is the organ of vision.
- Organizable*, *a.* susceptible of being separated from the blood, and so modified as to be made an elementary particle in the composition of an organ by the action of appropriate vessels.
- Organization*, *s.* the act of forming, or the state of being formed, into the mode of structure which is proper to all living bodies in general, and to each of the parts of a living body in particular:—this mode of structure is so named because it consists of an assemblage of parts or organs, which, though quite different in their shape, composition, and structure, in the economy of an animal; nevertheless unite in giving this animal its peculiar form and in manifesting its possession of vitality.
- Osseous*, *a.* having the properties of bone.
- Ossification*, *s.* the act of being formed into bone, the state of being bone.
- Oxalic*, *a.* the acid so named exists freely in the leaves of the oxalis acetosella or wood-sorrel and other plants.
- Oxygenated*, *a.* containing oxygen, which though a simple body, is one of the most important agents in nature; it produces acids, supports combustion, and is essential to the continuance of animal life.
- Pancreatic*, *a.* belonging to the pancreas, which is a long flat gland situated under the stomach.
- Papular*, *a.* consisting of small accumulated elevations.
- Parasitic*, *a.* animals or vegetables growing on or in others are so denominated, as the mistletoe on the oak and worms in the human body.
- Periosteal*, *a.* consisting of periosteum, which is a delicate membrane investing the surface of bones.
- Permeability*, *s.* the quality or state of admitting a passage through its structure.
- Perspiratory*, *a.* performing or relating to the act of excreting through the skin.
- Pervasive*, *a.* having the power of passing through the whole extension.
- Phosphates*, *s.* these are salts formed by the union of phosphoric acid with different bases.
- Phosphoric*, *a.* having the properties of phosphorus, which is a yellowish semi-transparent substance, having the consistence of wax, and exceedingly combustible.
- Physiologist*, *s.* one versed in physiology, which is the doctrine of the natural constitution of things.
- Phthisical*, *a.* afflicted with, or disposed to phthisis or pulmonary consumption.
- Plethoric*, *a.* having a full habit, in which the proportion of blood and other fluids is greater than accords with natural health.
- Pleurisy*, *s.* inflammation of the membrane that lines the chest and incloses its organs.
- Pulmonary*, *a.* of or belonging to the lungs.
- Puriform*, *a.* resembling or having some of the properties of pus, or the matter discharged by healing sores.
- Putrescent*, *a.* having a tendency to become putrid.
- Reaction*, *s.* return or reflection of any impulse or force impressed by the body upon which such impression is made.
- Recognizable*, *a.* such as may be perceived and avowed.
- Reflection*, *s.* the act of throwing or bending back.
- Refrigerate*, *v.* to make cold.
- Repercussive*, *a.* having the power of driving back or causing a rebound.
- Repose*, *s.* rest, particularly rest in sleep.
- Remedial*, *a.* possessed of healing qualities.
- Resuscitate*, *v.* to animate, to raise from insensibility, to bring to life again.
- Revivifying*, *a.* invigorating life, res-

- toring to life, renewing the vital actions when suspended.
- Rythm*, *s.* the equal tenour or progressive harmony of action.
- Sanguineous*, *a.* constituting blood.
- Sanguiferous*, *a.* conveying blood.
- Saccholactic*, *n.* having the properties of sugar and milk
- Sebaceous*, *a.* resembling suet; the sebaceous glands are those which secrete a suety fluid.
- Secretible*, *a.* having the qualities that make it the subject of secretion.
- Secretion*, *s.* that agency in the animal economy which consists in separating the various fluids of the body from the blood.
- Sedative*, *a.* possessing the power of diminishing the animal energy without destroying life.
- Semitransparent*, *a.* imperfectly pervious to the light.
- Semipellucid*, *a.* dimly or not perfectly transparent.
- Senile*, *a.* being old, belonging to old age.
- Serous*, *a.* thin like the watery part of the blood.
- Somnolency*, *s.* drowsiness, inclination to sleep.
- Spasmodic*, *a.* distinguished by spasms, or violent and involuntary contractions of the part.
- Stimulative*, *a.* possessing the power of communicating excitements.
- Stridulous*, *a.* sounding harshly so as to offend the ear.
- Sulphates*, *s.* salts formed by the union of sulphuric acid with different bases.
- Superficial*, *a.* on, in, of, or belonging to, the skin or surface of the body.
- Textural*, *a.* forming a texture, or integral part of the body, particularly arranged.
- Topical*, *a.* being in a particular place, local.
- Tissue*, *s.* in anatomical analysis, a tissue is a simple elementary portion of an organ.
- Transpiration*, *s.* the act of oozing through something, as the sweat issues from the pores of the skin.
- Typhoid*, *a.* resembling typhus or low fever.
- Umbilical*, *a.* relating to the navel.
- Vaccination*, *s.* the act, practice, or method of transferring or communicating the cow-pox by insertion of the matter.
- Variolous*, *a.* belonging to or constituting the small-pox.
- Vascular*, *a.* forming a vessel, consisting of vessels.
- Vascularity*, *s.* the state of possessing vessels.
- Vernal*, *a.* belonging to the spring.
- Ventral*, *a.* being in, or belonging to the belly.
- Ventricle*, *a.* any small contractible cavity in the animal body, particularly those of the heart.
- Vermifuge*, *a.* having the specific, mechanical, or chemical property of expelling worms.
- Visceral*, *a.* belonging to, or being in, a viscus or bowel, as the liver, kidney or spleen.

ERRATUM.—At page 13, line 17, for *month* read *week*.

INDEX.

- ABSORPTION**, influenced by exercise, 169
 Animal heat, 93
 Animation, means of restoring, 115-16
 Antimony, a harsh emetic, 218
 Ass' milk, its properties, 75
 Atmospheric air, its influences, 108, 125

BALANCING, as an exercise, 155
 Biscy milk, 77
 Billiards, an elegant exercise, 141
 Births in the 4th, 5th, 6th, 7th, and 8th months, 6, 7
 Bitch' milk, has cured epilepsy, 76
 Bleeding from the nose, 249
 Blisters, the effects and uses of, 200
 — blotches and blains, 302-3
 Blood, arterial and venous, 24
 Bones, first organization of, 14
 Bones, their gradual formation, 5, 10
 Brain, its formation and growth, ... 15
 — protrusion of the, 228
 Breasts, tumours in the, 240
 Burns and scalds, 242
 Butter, its qualities, 69
 Butter-milk, the properties of, 173

CALOMEL, 267, 277, 282, 289
 Caloric, the vital and material, 93
 Carriages, exercise in, 157
 Chilblains, treatment of, 241
 Central pulp of a tooth, 50
 Cephalic diseases, 298
 Chicken-pox, 310
 Childhood, natural history of, 32, 40
 Chincough, its nature and treatment, 290
 Circulation, effects of exercise on the, 165
 Club-foot, 232
 Cold, its various influences, 111, 116
 — or catarrh, 293
 Colic and pains in the bowels, 271
 Convulsions and inward fits, 298
 Corns, how managed, 239
 Costiveness of children, 266
 Couches, use of suspended, 239
 Cow's milk, its qualities, 65
 Cow-pox, its beneficial influences, 316-18
 Cradles as beds for infants, ... 147-9, 185
 Cream, the properties of, 72
 Croup, is acute or chronic, 286
 Curd, or the cheesy substance, 57
 Cutaneous diseases, 301

DANCING, as exercise, 137
 Dandling infants, how useful, 146
 Dandriff of children, 304
 Deafness, temporary, 255
 Deformities of fingers, toes and feet, 231
 Dentition, history of its progress, 40-63
 Digestion, effects of exercise on, ... 164
 Dislocations of joints, 227

 Dress, its properties and uses, 93
 — colour and shapes of, 97-8
 — for infants, 101
 — for children and adults, ... 103-4
 Dry air, its effects, 117

EAR-ACHE, its causes and cure, 252
 Emetics, their particular action, ... 215
 Emetic tartar unfit for children, ... 218
 Enamel of the teeth, 49
 Exercise, different kinds of, 107
 — view of its advantages, ... 173
 Exhalation, effects of exercise on, ... 170
 Eyes, their growth before birth, ... 5
 — inflammation of, 257

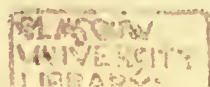
FACE, its first formation, 5
 Fauteuil de Postc, 159
 Feeling, incomplete at birth, 27
 Fencing, a generous exercise, 140
 Fevers of infants and children, 276
 Field-sports, advantages of, 139
 Fœtal body, length of the, 20, 23
 — weight of the, 21-2
 — state, natural history of, ... 4, 22
 Fomentations, the uses of, 199
 Foods proper for children, 91
 Fractures before birth, 227
 Frictions, general uses of, 204
 — of new-born infants, 147
 Fruits do not tend to produce worms, 92

GAIT, manner of improving the, 15
 Games, the juvenile, 141
 Gargles, uses of, 198
 Goats' milk, qualities of, 71, 73
 Gripes, in the young, 251
 Gums, different affections of the, 251-2

HABIT, the power of, 98
 Hare-lip, in children, 235
 Head, progressive growth of the, ... 5
 — its compression in the birth, 228
 Hearing, defective at birth, 26
 Heart, its first formation, 4, 13
 — inflammation of the, 286
 Heat, the influences of, 109
 Herpetic eruptions, 309
 Hives, or globular pox, 310
 Humid air, influences of the, 116

IMAGINATION, the maternal, ... 227, 245
 Infancy, natural history of, 22, 32
 Infants, male and female, differ-
 ences of, 24
 Instinct, the maternal and infantile, 220
 Insolation, the influences of, 110
 Ipecacuan, the mildest emetic, 217
 Itch, four kinds of the, 308
 Ivory of the teeth, 49

- JAUNDICE, the infantile,.....301
- Koumiss, a beverage of the Tartars, 72
- LAUDANUM, injurious to infants,.... 186
- Lavements or injections, uses of,....195
- Laxatives, their uses and influences,213
- Leeching, rules regarding,.....206
- Light, the effects of,.....109
- Liniments, their uses,.....200
- Liver, disease of,272
- Locomotion, its effects on the body, 172
- Loose and fetid dejections,.....268
- Lotions, uses of,.....199
- MARE's milk, its qualities,..... 74
- Marks and spots on the skin,.....245
- Measles,.....313
- Meconium, nature and uses of,.....17
- Medicine, the general effects of,....210
- Milk, the natural history of,.....64, 81
- Mineral waters,.....193
- Motion, effects of spontaneous,....130-133
- Mumps, or inflamed gland under the ear,.....294
- Muscles, their state before birth,.... 11
- NAVEL, bleeding from the,.....236
- ulceration of the,.....237
- Navel-string, protrusion of the,....237
- Nipples, milk-like fluid in,.....239
- Nurse's milk affected by food, disease, and the passions,.....69, 82
- Nurses, rules for choosing,.....88-9
- Nursing, instructions to mothers on, 87
- Nutrition, its different processes, 63-93
- influences of exercise on, 170
- OPEN of the head,..... 7
- Ophthalmia of infants,.....257
- its nature and cure,....258-9
- Organs, they all exist in the first germ of man's material essence,.... 19
- PASSAGES, closure of the natural,....228
- Patting of infants, its advantages,....146
- Poultices, very extensively useful,.... 20
- RASH, the nettle,.....313
- — pale gum,302
- — red gum,301
- — rose,.....312
- — wild-fire,.....301
- — teeth,.....302
- — white gum,.....301
- Respiration, effects of exercise on,.... 68
- Riding on horse-back,.....156
- in carriages,.....157
- Ring-worm,309
- Rose, the infantine,.....312
- Running, its effects as an exercise, 136
- Ruptures, different kinds of,.....229
- SAILING, as an exercise,.....161
- Scalds and burns,.....242
- Scall, the branny,.....307
- — honey-comb,.....306
- Scall, the lupine,.....307
- — milky,.....305
- — ring-worm,.....307
- Scalped head,.....305
- Scarlet fever,.....314
- Scrofula, and serofulous habit, 278, 284
- Sea-voyages, their effects on health, 161
- Secretion, influences of exercise on, 170
- Sensation, effects of exercise on,....171
- Sheep's milk, qualities of,.....81-73
- Shingles,.....309
- Sickness and vomiting,.....270
- Singing, as an exercise,.....142
- Skin-bound, is a constitutional and hereditary affection,.....304
- Sleep, its nature and influences,....179
- Small-pox,.....315
- Smell, state of its organs at birth,.... 26
- Spine, its comparative lengths,..... 11
- Squinting, its causes and cure,....243
- Still-born children,.....224
- Strumous decline,.....275-8
- Stye, often caused by indigestion,....257
- Sutures of the skull,..... 33
- Swimming, as an exercise,.....142
- Swine-pox,310
- Swinging, its effects on health,....154
- TABOURET, or riding machine,.....159
- Taste, enjoyed by new-born babes,.... 27
- Teeth, the primary state of,..... 11
- their elements, number and structure,..... 40
- their chemical composition,.... 58
- transplantation of,..... 61
- Teething, difficult and painful,....297
- Tetters,.....309
- Thoracic diseases,.....285
- Thrush, is infectious,.....295-6
- Thymus gland, uses of the,..... 12
- Tongue-tied children,.....233
- Tooth-ache of the young,.....250
- Tumours resembling warts,.....238
- VAPOUR-BATHS, uses of,.....192
- Variations of temperature,.....118, 129
- Vesicular fever,.....311
- Vision, imperfect in early infancy,.... 26
- Vitus, the dance of St.,.....273
- Voice, the physiology of,..... 36
- Vomiting, its effects on disease,....216
- WALKING, as an exercise,.....134
- infants' first attempts at, 151
- Warm-bath, its influences,.....192
- Warts the treatment of,.....238
- Water, its general effects,.....188
- cold, 188—tepid,.....191
- warm, 191—hot,.....192
- Water in the head,.....299
- Water-pox, four varieties of,.....310
- Whey, the properties of,..... 65
- Whitlow, how to be treated,.....256
- Worms, medicines for expelling,....260
- Wrestling, as an exercise,.....141
- Yellow gum, or jaundice of infants, 301



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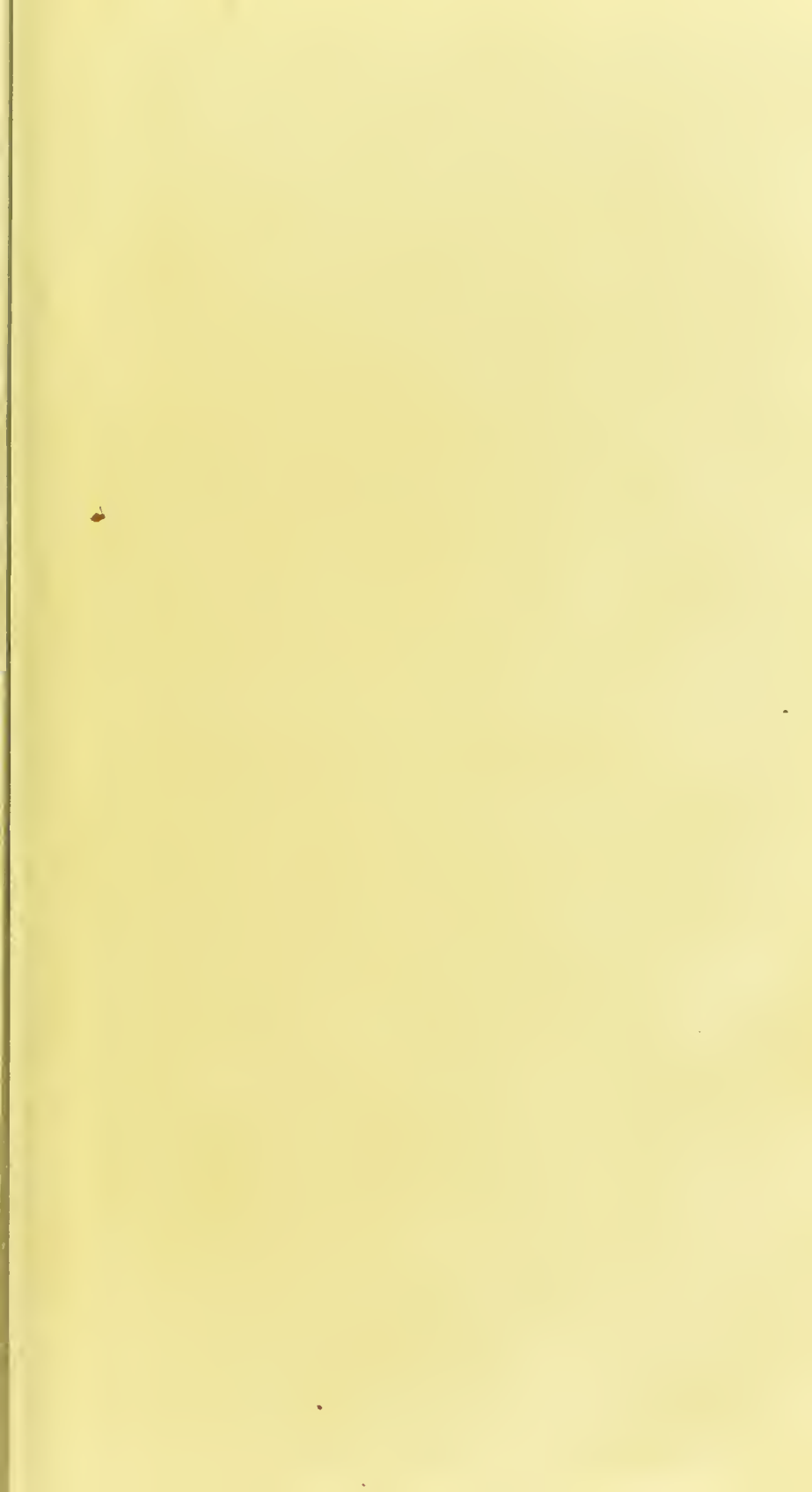
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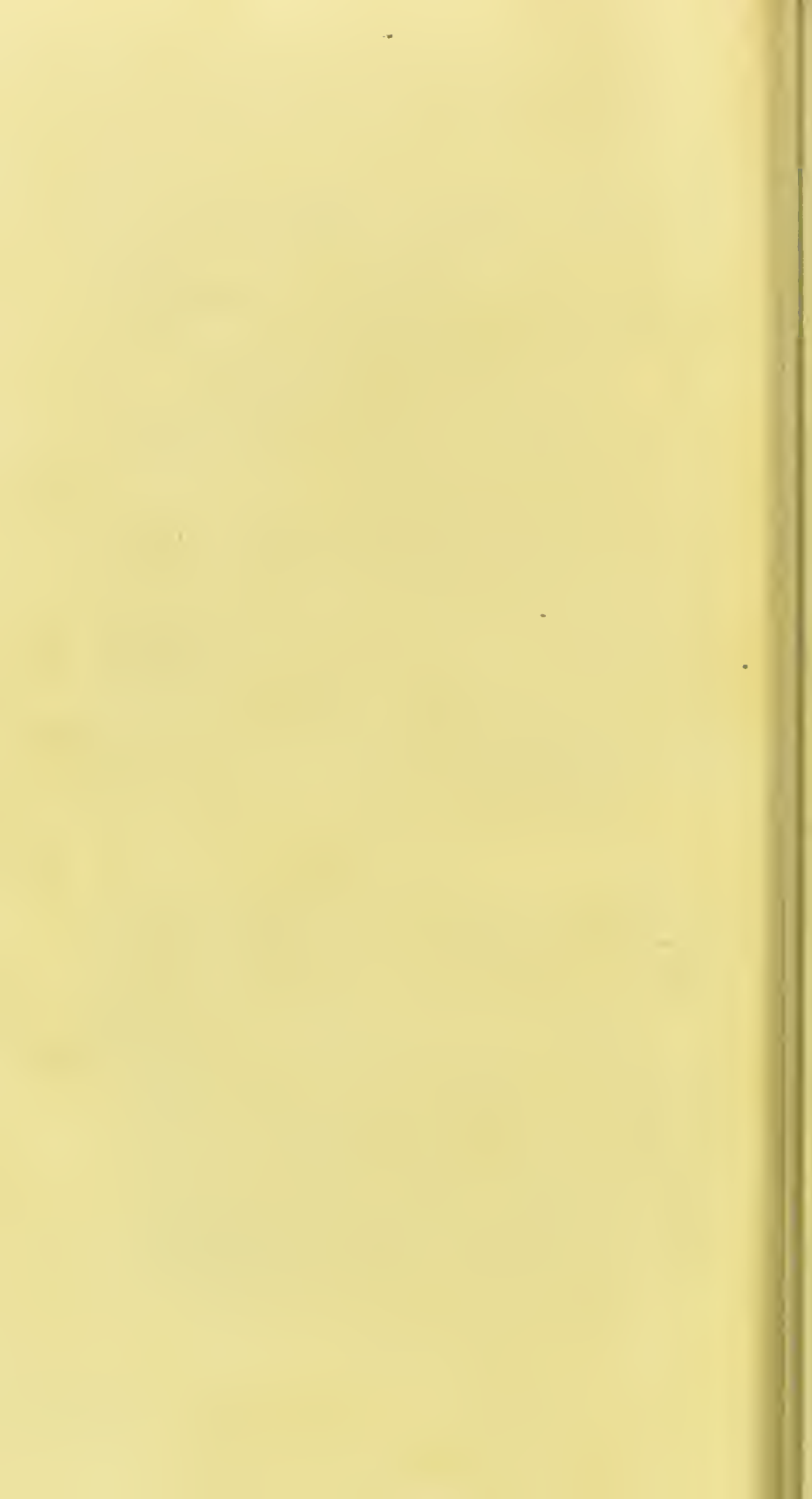
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52



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